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THESIS

EARLY DELIVERY OF PURCHASED MATERIAL:
A DOD PROBLEM

Gerald A. Burleigh

December 1986

Thesis Advisor:

Thomas P. Moore

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The objective of the research effort, once it was established that early deliveries do in fact occur, was to explore those factors and costs associated with receipt of material prior to the required delivery date. Emphasis was placed on the factors of holding costs and production lead time as they relate to the costs and consequences of early deliveries.

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Early Delivery of Purchased Material:
A DOD Problem

by

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Submitted in partial fulfillment of the
requirements for the degree of

MASTER OF SCIENCE IN MANAGEMENT

ABSTRACT

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I. INTRODUCTION

A. RESEARCH OBJECTIVES

What costs are associated with the early deliveries of material before the Required Delivery Date (RDD)? The Department of Defense (DOD) presently accepts supplies when they are delivered, even if earlier than required. This early acceptance may be costly, when the early delivery is not desired. Civilian industry is moving to embrace various management concepts of minimum inventory levels with the most extreme of these views being "just in time". Under these concepts early delivery of procured material is a foreign concept. Early deliveries are not free. But what is the cost to the government, and how significant is it?

The issue of early deliveries and their consequences for the Navy was first raised by Naval Sea Systems Command (NAVSEA). The early delivery of shelf-life material was a primary concern and the subsequent deterioration of the material before it could be issued. This led to NAVSEA's recommendation that the Federal Acquisition Regulations (FAR) be amended to include clauses prohibiting the early delivery of material and services unless specifically allowed in the contract. For the specific language proposed by NAVSEA see Appendix A. This concept departs significantly from customary government practice, where late delivery is the

primary concern. Having no information available to support or refute this hypothesis, the Office of Naval Acquisition Support (ONAS), prior to its disestablishment and absorption into the Assistant Secretary of the Navy for Shipbuilding and Logistics, requested that the issue be investigated to see if there was merit in bringing it before the Defense Acquisition Regulations (DAR) Council. If this issue proves to be a significant problem, the DAR Council will need to take action. If there is no demonstrated evidence that early deliveries are a burden, NAVSEA's recommendation for amending the FAR can be returned with evidence that there is no problem.

B. RESEARCH QUESTIONS

The primary research question, which was the focus for this research is:

What effect does the early delivery of material have on managements ability to control expenditures?

From this basic question, three subsidiary questions were developed:

1. Are early deliveries an extensive problem with certain industries or products?
2. What are the positive and negative affects of DOD's ability to manage inventories?
3. Would contract clauses specifying window delivery schedules be an effective means of dealing with early delivery?

C. RESEARCH QUESTIONS

This research concentrates on the area of acquisition of spare parts for inventory replenishment. The logical choice for a source of information when dealing with any issue concerning the procurement of spare parts for the Navy is one of the Navy's two Inventory Control Points. The source selected for this research was the Navy Ships Parts Control Center (SPCC), Mechanicsburg, Pennsylvania. The scope of this research effort has been limited to SPCC managed items and to "C" type spare contracts. It is relatively easy to identify whether material is delivered for production type contracts for the routine acquisition of spare parts early, on time, or late, because of the very nature of the material purchased.

Information has been gathered from various sources at SPCC including the procurement community and the item manager community. Some of the information was strictly the opinion of the various individuals and backed-up or amplified the data provided. SPCC's Contracts Completed File was the source of data for this research. This database contains approximately 14,000 records of procurement actions completed before RDD. The database consists of purchase orders, delivery orders, and "C" type contracts. Purchase orders are small purchases. Delivery orders may be for stock, but all are negotiated (normally sole source)

actions. "C" type contracts are for inventory replenishment and are awarded for either competitive or negotiated (sole source) solicitations. Since the research effort concentrated on replenishment of inventories, the data base was queried for all "C" type contracts completed before RDD. A computer printout of 545 "C" type contracts was generated. Appendix B contains the listing.

D. RESEARCH METHODOLOGY

The primary research methodologies employed were a combination of analysis of empirical data and telephone interviews.

The empirical data for this research was a computer listing of 5454 "C" type contracts completed before RDD. Contracts delivered within 60 days of the RDD were not considered to be significantly early. Of the 545 contracts delivered early 246 (45%) were completed more than 60 days early. Of the 14,000 contracts completed early, 6530 (46%) were completed more than 60 days early. The early contracts were broken down into 30 days periods. A total cost-to-hold was derived by applying the holding cost rate to the total contract values per period. The data provided the number of contractors and inventory managers involved in early deliveries as well as the types of material that are delivered early.

The structure of the interviews was established from a series of questions identified during an extensive review of the current literature. While the data on contracts delivered early was readily made available, no direct contact was possible with the individual inventory managers. The program Support Office of the Weapons Systems Support Group (05 Staff) did not want the daily routine of the IMs interrupted by telephone calls and questions from the researcher. Thus the scope of the interviews was limited by the 05 Staff who acted as the filter between the researcher and the inventory managers. The 05 staff personnel investigated selected contracts upon request and provided specified information. Upon completion of the review of the data from SPCC, interviews were conducted with a number of contractors who were found to have delivered material early.

The secondary research methodology employed was an extensive review of relevant literature. The review was conducted to obtain an historical perspective on delivery schedules and their formulation. Various sources such as the Naval Postgraduate School Library, the Defense Logistics Studies Information Exchange (DLSIE), the Defense Systems Management College were used. Various current publications proved helpful in the formulation of

perceptions. These useful sources of information are contained in the reference and bibliography sections of this paper.

The information thus obtained was analyzed, compared, and contracted in order to obtain a picture of the various institutional forces, effects and considerations relevant to the problems of early delivery in the management of wholesale spare parts.

E. ORGANIZATION

Chapter Two describes the legal and regulatory framework of the procurement process within which the early delivery problem operates, as well as the real and perceived affects of early deliveries on DOD. The role and responsibilities of SPCC as a Navy Inventory Control Point are described. A description is given in the characteristics of the work performed by inventory managers and a summary of how the environment effects the way they respond.

Chapter III gives a detailed examination of the prime cause of early deliveries: required delivery dates which are based on over-estimates of production lead times.

Chapter IV discusses the specific costs that can be directly associated with early deliveries. This chapter specifically concentrates on holding costs and its various elements. This chapter also describes the relationship of holding costs to reorder quantities and reorder points.

Chapter V presents an analysis and description of the data obtained from SPCC. The estimated extent of the delivery problem is assessed. The causes of the problem are identified and categorized. Considerations for further actions are given. This chapter presents the availability and effectiveness of remedies and controls are described.

Chapter VI is a summary of the researcher's findings and conclusions with proposed recommendations for action future research.

II. BACKGROUND

A. GOAL-ON-TIME DELIVERY

DOD's inventory management mission is to provide material where and when needed to support a given unit mission within financial constraints. The inventory managers (IMs) and procurement personnel in the various DOD inventory control systems must acquire the correct materials in correct quantities, from appropriate sources, at the right time to support DOD's numerous missions. [1:7]

In industry, companies are aware of and can substantially influence any one or more of the variables in the acquisition cycle: getting the right quality, quantity, and prices, from the right source at a specified time. Within DOD, acquisition personnel are governed by the provisions of the Federal Acquisition Regulations (FAR) and it's supplement, the Defense Acquisition Regulations (DAR). The FAR specifies the types of procurement actions which may occur. In addition, there are numerous laws, policies, and regulations imposed by Congress and the Office of the Secretary of Defense to protect the public interest. These socio-economic considerations result in procedural limitations which serve to limit acquisition personnel in their ability to control the variables that their counter-parts in industry can control.

There is no portion of the FAR that deals explicitly with early deliveries. Parts 12 and 52 of the FAR address, in generic terms, the delivery of material. Appendix C contains the appropriate clauses from the FAR dealing with delivery of material. According to the FAR Part 12:

The time of delivery of performance is an essential contract element and shall be clearly stated in solicitations. Contracting officers shall ensure that delivery of performance schedules are realistic and meet the requirements of the acquisition. [2:12.101]

Part 52:212 of the FAR provides those clauses that the contracting officer may insert in solicitations and contracts for supplies or services. Thus the FAR Part 12 and 52 pertain to the delivery and performance aspects the contract, but do not address early delivery explicitly.

The Services within DOD manage highly complex, widely dispersed inventories of spares and repair parts. The value of these inventories is over \$50 billion. This inventory provides the material support needed to ensure that weapon systems' readiness and military operational capability are maintained to fulfill US commitments and tactical goals.

The Services have traditionally relied upon semi-mathematical inventory models, sophisticated information systems, and complex logistics support procedures to ensure that inventory costs are minimized, consistent with assigned readiness goals and desired logistics support capabilities within financial constraints. [3:1-1]

Ensuring that required materials is delivered at the right time is one of the most critical of the variables. Spare parts must be identified and procured in such a manner as to allow sufficient time for delivery to the end user, with consideration given for production, inspection and shipment. As noted by Lee [1:8] material should be delivered at the time desired by the requester. It should neither be earlier nor latter than the required delivery date (RDD). The material, allowing for anticipated contractor lead times, should be procured such that it is available to the requester at the point in time considered necessary to meet the customer's requirements. DOD has found this to be an elusive goal: trying to ensure that supplies arrive at their designated sites on time, whether it is 1958 or 1986. It has been estimated that throughout DOD, one contract in four has not met its delivery schedule. [1:8] There is nothing new or startling in this discovery, for as early as 1958 Harbridge House Inc., in a study for DOD, reported that:

46% of the total lead times were longer than predicted by an average of 3.3 months late. Thus nearly half of the procurements were delivered late and the average tardiness (3.3 months) amounted to 43% of the predicted lead time. On the other hand, 31% of the procurements were delivered early, by an average of 2.7 months early. While these early deliveries cannot hurt performance, needlessly long predicted lead times do cause unnecessary investment in pipeline investment because of the higher reorder levels.

In studying predicted versus actual ALT's and PLT's, 57% of the ALT's were greater than predicted (by an average of 3.4 months), while only 18% of the PLT's were greater than predicted (by an average of 2.6 months).

Conversely 17% of the ALT's were less than predicted (by an average of 1.2 months) and 57% of the PLT's were less than predicted (by an average of 2.3 months). ALT has been underestimated and PLT has been overestimated. [4:21]

In a similar vein a GAO study of DOD component's use of differing methods for projecting PLT resulted in a GAO contention:

Inaccurate PLT information is being used . . . to determine secondary item requirements. While some items had understated requirements, the vast majority of items were overstated. GAO observed that these inaccuracies resulted in a less than optimum use of secondary funding. Follow-up information in 1984 from GAO verifies their original contention. Updated information was obtained on 212 of the original 257 sample items. Of these, the PLT has been changed on 175 items; 142 items reflect decreasing PLT, 33 reflect increases in PLT. [5:7]

While conducting the literature search, the researcher was unable to uncover any specific research directed at early deliveries of material as a problem for DOD. The very thought that early deliveries could be a relevant or serious problem had not been addressed in any research. All research concerning deliveries dealt with the problems associated with delinquent contracts. At most the subject was addressed, as in the Harbridge House study, as a one-liner or as a sidelight in comments on delinquent contracts. However, it should be noted that potential areas of research were indicated concerning the cost-of-holding material and production lead times as they relate to the EOQ inventory models.

B. SPCC - INVENTORY CONTROL POINT

Ships Parts Control Center (SPCC), Mechanicsburg, Pennsylvania is one of two Navy Inventory Control Points (ICP), (the other being the Aviation Supply Office (ASO), in Philadelphia, Pennsylvania). SPCC's mission is to provide cost effective and responsible supply support to the fleet.

[1:19] In support its customers, SPCC provides enhanced combat readiness to the fleet.

SPCC manages an inventory of over 500,000 line items. This material ranges from valves, pumps and seals to complex electrical components for missile systems. SPCC also has the central management responsibility for conventional ammunition. [6:3-4] While SPCC manages many line items, few of these items are physically stocked at SPCC. Rather, these items are distributed world wide at various Naval Supply Centers (NSC), Naval Supply Depots (NSD) and aboard numerous Fleet Stores Ships located where they are accessible to the fleet. Through these stockpoints, SPCC monitors the material transactions of these items world-wide and can directly control the issue of critical items. Thus the Navy wholesale supply system is a complex operation involving numerous interfaces world-wide with continuous transactions occurring. The Navy's supply system's customers obtain material using decentralized requisitioning procedures for most of what they require, submitting their

requirements for material to the Navy stock point in their area of operations. Normally, material issues will take place from the stock point closest to the customer with the stock point reporting the issue to SPCC via a Transaction Item Report (TIR). If the stock point cannot fill the request, the requisition document is passed to the applicable ICP via the AUTODIN communications network for action. If SPCC locates the item, the stock point having it will forward it to the customer. If, however, SPCC cannot fill the request, the requirement will either be backordered or a spot buy will be made.

The process of making material available for issue involves requirements determination, material procurement and procurement funding. These functions make up the core of SPCC's Supply Operations Group (SOG). The SOG's five major functions which relate to the deployment/operations phase of weapon systems life cycle support are: requirements determination, material procurement, procurement funding, material issue and repairable's management. The IMs are able to accomplish this by using computers to process multi-variable data which includes procurement lead time (administrative lead time and production lead time), risk, holding cost, and safety levels to determine a reorder point and an economic order quantity (EOQ) for each stocked item. TIRs provide the current input data on what material has

been received and what has been issued. The system of recording TIRs and referrals is the means by which the IM obtains information about what is occurring with their items. SPCC Uniform Inventory Control Programs (UICP) use this information to compare the actual stocked levels of material with projected requirements and monitors the status of each line item. These programs determine whether or not a buy is necessary, based on the current stock level, and the predetermined reorder level. The result is a recommendation to the IM to either buy or repair material to meet the customer's need [6:3-7; 1:21]

To fulfill its customer's needs, SPCC engages in routine stock buys to meet anticipated demand. SPCC will also initiate spot buys for items not carried or for high priority requirements for items not in stock. In FY85, SPCC engaged in over 63,600 acquisition actions at a value in excess of \$1.4 billion. The bulk of these actions, 56,800, were small purchase actions. According to SPCC, historically approximately 90% of their total actions (small purchases) account for 20% of the funds obligated. Spot buys are normally for a quantity of one each to fill an immediate requirement.

Funding for stock procurements come from the Navy Stock Fund (NSF) which is a revolving fund. The fleet users order material carried by (or under) the stock fund, pay for it

out of their assigned operating fund, and SPCC then replenishes (or repairs) its stocks with the fleet provided funds.

As an inventory control points, SPCC is responsible for managing weapon system life cycle support. As such, SPCC decides who, what, when and how the Navy will provide logistic support to a weapon system. At the same time that the hardware systems commands are releasing the first production contracts, SPCC is determining the inventory management responsibilities and the range and depth of spare parts support for the system, as well as building computer and technical files that support the system and preparing and publishing the Allowance Parts List.[1:22]

When the weapon system is actually delivered to the fleet, SPCC's Supply Operations Group must support it. The initially provisioned spare parts are supposed to last until actual demand patterns have been established via usage data to make requirement determinations. Program support and the supply support for weapon systems proceed simultaneously with the inventory manager (SPCC) having prime responsibility to support the system in the fleet.[1:25]

C. INVENTORY MANAGERS (IMs)

The IMs at SPCC are primarily responsible for ensuring that spare parts are available where and when needed to support fleet operations. Their responsibilities in carrying

out this task are complicated by:

- conflicting task objectives;
- pressures from superiors and customers;
- diverse organizational and personnel interfaces required in the complex wholesale supply system environment;
- plus a world-wide disbursed fleet.

Each IM must determine when and how many units of repair or buy; where to best position this material to meet demands; how to dispose of excess material; and how to obtain an appropriate procurement budget.

On a daily basis the IM must decide which units to buy or repair and what quantities to procure in order to do well on their measures of support performance. Unfortunate, they must perform well without creating long supply assets or exceeding funding constraints. They are required to have neither too little nor too much. This is an impossible task in an environment where an IM may manage a thousand line items, and where each line item has numerous of pieces of informations that are subject to change. Because of personnel constraints and supply operations, each IM must depend on many people throughout the ICP and the supply system to buy, repair, package, ship and place their material in storage. Similarly, when locating the material for future demands, the IM must decide how much is too much or too little at any site. The disposal of excess material

raises the question of how much stock is truly excess to future demands.[6:71-72]

D. ECONOMIC ORDER QUANTITIES

An inventory is essentially an idle resource which is being temporarily stored for use at some future time. The primary purpose of storing resources is to separate the supply and demand processes. DOD logistics systems have long used inventories to compensate for or to buffer operating problems and deficiencies in procurement, transportation, warehousing, and maintenance. Because DOD inventory requirements are basically developed under the previously mentioned logistics operating system philosophy, as processing times and leadtimes grow, inventories also grow to accommodate them. [3:4-3]

Because maintaining any type of inventory incurs expenses, the benefits of holding the inventory must equal or exceed the holding and ordering costs. The process of balancing these costs and the benefits is inventory management. Inventory management is a pivotal activity in any logistics organization. It requires tradeoffs in balancing customer service needs with operating costs. This management task is particularly challenging in the military setting where item availability often affects mission readiness. The two fundamental issues in controlling any inventory are when to order and how much to order. When the

demand for an item is uncertain, a level of safety or buffer stock must be carried to meet unpredicted demand when making these decisions. [7:2]

Inventory management attempts to balance the costs and benefits of holding stock. This balance is directly affected by the level of stock held by the organization. Low stock levels result in low customer service and high ordering costs. High stock levels increase the level of customer service while decreasing ordering costs. However, high stock levels can have undesirable effects such as increased storage costs, high capital investment and increased risk of obsolescence. High stock levels will increase holding costs. When stock levels and service levels increase, holding costs will increase and ordering costs decrease. [7:20]

The traditional inventory models used by DOD are based on the cost minimization principles used the commercial enterprises for which the models were originally developed. The Department of Defense (DOD) has adopted the models as a basis for inventory decisions, even though DOD's objectives do not always include cost minimization. Within the services, inventory management decisions are more typically directed towards maximizing the support of the forces, within the budget limits set by the policy makers. [8:1]

For DOD the total variable costs of stockage are composed of numerous elements which can be classified as:

(1) cost to order, (2) cost to hold, or shortage costs.

Economic inventory policy is an effort to minimize the total variable costs. This is achieved when holding costs for an item equals the cost of ordering over the same time period. The quantity ordered each time the reorder point is reached brings the total stock on hand on delivery date back to a desirable level. The only deviation from an exact balance between holding cost and cost to order is the cost of holding the safety level quantity for its life-span beyond the next delivery date. [9:2]

The wholesale replenishment model used by SPCC is a cost minimization EOQ inventory model. A stock item's order quantity and reorder level are established in large part by the unit price and procurement lead time forecasted for the item. When a replenishment is needed, the order quantity is specified and the procurement officer requests bids from vendors who provide both a unit price and production lead time.

SPCC treats the wholesale level inventory management of an item and the procurement of replenishment stock as separate functions, although they are key elements of the same supply system and share the common goal of maximum fleet support within limited budgets.

The UICP inventory models determine the reorder level and order quantity based on data from recent procurements. When the inventory drops below the computed reorder point, a buy order is generated with an ICP established delivery date. After the order is placed, a new reorder point and reorder quantity is computed for replenishing the inventory.

There is an inventory level at which the total costs of shortages, ordering and holding the inventory are minimized. If the sole objective of inventory management were to minimize these costs and they could be quantified, the inventory level would be found by minimizing the sum of the ordering costs, shortage costs, and the holding costs. This inventory level would determine the level of service. But not all shortages, ordering and holding costs can be quantified. There are two other inventory management objectives in addition to minimizing the quantifiable shortage, ordering and holding costs. One is to provide a certain level of service. The second is to reduce or limit the size of the inventory. For DOD, the level of service is actually a measure of shortage costs, while inventory size is a substitute for the opportunity cost of the inventory investment, which is one of the holding costs. These costs are difficult to measure, and for DOD, it is often not possible to quantify them. Therefore, the basic objective of inventory management for DOD is to minimize the

quantifiable ordering and holding costs, provide a certain level of support to the forces, and limit the size of the inventory due to budgetary constraints. [7:21]

Inventories with stochastic demands and procurement leadtimes require that safety stocks be maintained to absorb the variations in demand and lead time. Safety stocks also reduce the possibility of stockouts caused by leadtime and demand forecast errors. At SPCC safety stocks must be carried because both the demand and lead time are stochastic. Safety stocks are the difference between the expected demand for a period and the level of stocks held to meet the demand for the period. Under the continuous review situations, spare parts are ordered when the inventory level reaches the reorder point. The difference between the reorder point and the safety stock level is the expected or mean demand during the procurement leadtime. The safety stock will (hopefully) fulfill the demands in excess of the expected demand. The excess demand represents the demand forecast error demand variability during the leadtime period. If the demand forecast error and variability exceeds the level of safety stocks held, stock-outs may occur and backorders accumulate. Conversely if such a large demand fails to occur, there will be excess stock on hand. Spare parts will become excess material or long supply. [7:24]

There is no single universal model of successful inventory management due to the wide variety of production requirements and the differences in shortage, ordering and holding costs within and between industries. Near-term and long-term fluctuations in market conditions demand different material management strategies.

Holding costs and production lead times (PLT) play major roles in the determination of safety levels and thus reorder points in the EOQ models. An erroneous PLT forecast can lead to excessive delivery dates (material delivered early) or too short delivery dates (material delinquent). This issue will be addressed in detail in Chapter III.

III. PRODUCTION LEAD TIME

A. BACKGROUND

For each item managed by the ICP, the UCIP EOQ model used by SPCC computes the value of the reorder point and the order quantity which minimize the average annual variable costs of ordering, holding, and time-weighted backorders for the item manager. These models are based on the traditional steady-state continuous review lot size reorder point models for stochastic demands. They operate under the assumption that there is a constant price and a constant procurement lead time for each item. With the assumption of a constant price, the average annual total procurement costs is a constant value independent of the decision variables, order quantity and reorder point. As a consequence, this cost term can be ignored in computing the reorder level. However, both procurement cost and production lead time (a portion of procurement lead time) can vary depending on which vendor is chosen. The impact of lead time on the optimization is concentrated in the determination of the reorder point. However, the determination of the reorder point influences not only the service level (shortages) but also the expected inventory holding costs. [6:3-A-15; 10:9]

The UICP inventory management models at SPCC determine the optimum order quantity and reorder level for an item

based on that item's forecasted quarterly demand rate, procurement lead time and unit price. Therefore, leadtime forecasts are one of the factors that must be considered in the planning and budgeting process for new weapons systems, spare parts support of operational systems, and all ICP inventory requirements determinations. As long as material and component leadtimes are following historical patterns, the leadtimes can be assumed by be fairly reliable for future planning. However, if actual leadtimes are significantly different from forecasted leadtimes errors are introduced into the inventory management process. For example, the timing of replenishment of spare parts has been based on the leadtimes actually experienced on the last order for each particular part. If the leadtime has increased greatly, the probability of not maintaining adequate support of operational systems increases greatly. A crisis management situation will evolve as the IM tries to support the forces. Conversely, if leadtime has decreased considerable, the parts are ordered in advance of the actual need--at the potential expense of other needs (opportunity costs) and with an increased risk of obsolescence or having excess material in inventory requiring disposal. [11:2-3]

Thus the accurate forecast of leadtimes is an essential ingredient in the ability of planners and managers to accurately forecast their resource requirements and provide

additional insight into necessary modifications to inventory holdings. It is crucial for military planners to more accurately determine their true needs as the competition for scarce resources increases.

Leadtimes vary from item to item within companies. They can also vary markedly for the same item from company to company. The exploration of the numerous reasons for this variability would entail a substantial research effort. However, some of these reasons are the result of various buying policies, inventory practices, relationships with vendors, the product being procured, and its particular specifications, imagination of purchasing staff and adequacy of planning [11:24]

B. PRODUCTION LEAD TIME (PLT)

The forecast of procurement lead time is one of the most significant factors in the inventory management process because it helps determine when an order will be placed.

Procurement lead time consists of:

- a. Administrative Lead Time (ALT) - The time from when the requirements document is generated to the date when the contract is signed.
- b. Production Lead Time (PLT) - The time from the date of the contract to the date of receipt of the first significant contract delivery. [12:1]

The wholesale replenishment model is a cost minimization inventory model.

EOQ Model:
$$Q = \sqrt{8xAxD/IxC}$$

Where: A = Administrative Ordering cost per order.
D = Quantity demanded per calendar quarter.
I = Holding cost per year.
C = Replacement cost per year.

The Economic Order Quantity is the square root of 8 times the cost to order times the quarterly demand divided by the holding cost rate times the unit price.

The Reorder Level (RL) is computed:

$$RL = DxL + SL$$

Where: L = Procurement Lead Time in quarters
SL = Safety level, a function of demand and leadtime availability and the desired level of service.
D = Demand per quarter.

The variable operating costs of the wholesale system are assumed to be:

$$\text{Ordering Costs} \times \text{Holding costs} + \text{Shortage costs}$$

Where Ordering costs are the ICP internal administrative costs of placing orders The holding costs are those costs associated with maintaining on hand inventories - storage, obsolescence and opportunity costs. The shortage costs are those costs representing the cost to the system of incurring backorders. The objective is to find the order quantity, reorder level, repair quantity and repair level for each item that minimizes these variable costs. [6:3-24; 3-A-15]

If an item is ordered too early, scarce resources are tied up in unnecessary inventories. If stock is ordered too late, there will be backorders before new deliveries are received with the possibility that a spot buy will be required.

Under current procedures at SPCC, it is assumed that the ALT and PLT on the next buy will be the same as the ones on the most recent buy. Thus a stocked item's order quantity and reorder level are established in large part by the unit price and procurement lead time forecasted for it. The potential for under- or over-stating lead time is significant, as noted by Harbridge House Inc. and GAO in Chapter II, resulting in management problems due to spares either going into long-supply or developing shortages and backorders.

C. PLT AND RDD

A March 1984 DOD study of secondary item procurement leadtimes concluded that for FY83 PLT for all secondary items within DOD exceed \$15 billion. The study stated that one day of leadtime equates to approximately \$30 million--inaccurate and unrealistic estimates of leadtime can be quite costly. Overestimates of leadtime ties up funding that could be better utilized elsewhere, and increases the likelihood of long supply conditions and excess material that will have to be disposed of. Underestimated lead times result in stock-outs and a degradation of material and operational readiness [5:1]

The DOD study of secondary item procurement further concluded that all DOD components end administrative lead

time and begin production lead time at the contract award date. Defense contractors consider that the estimated delivery date specified in the contract is their lead time of record that that the ICPs should use that date to update PLTs. Since the contractor is legally obligated to meet the EDD, its use in PLT computation is valid. Most Defense contractors use lead time quotes from their vendors and subcontractors to develop lead time data. These contractors believe that valid quotes are far superior to historical data because quotes reflect current market conditions, whereas historical based projections of PLT tend to dilute the fluctuations in the economy. [5:7-13]

The soliciting of contractor quotes of lead time can be very useful in the inventory control process to establish an RDD. The contractors can be a valuable source of lead time information. If contractor information is considered valid, their leadtime estimates should be used whether they represent increases or decreases in the PLT used in their requirements computations.

However, the IMs can not totally ignore historical data. For example, there are several examples where a major contractor quoted leadtimes which the ICPs used in their requirements computation only to have that contractor consistently deliver much earlier than quoted. A PLT quote of 14 months was used by an ICP for requirements computation

purposes even though each of the last 3 procurements were delivered in under 5 months. The IM must be aware of the possibility that the contractor will try to beat the system. The leadtime quoted not only affects the quantity ordered but also affects the required delivery date specified in the procurement contract. [5:48]

Nevertheless, with proper monitoring, using estimates of leadtimes from contractors to determine the delivery schedule in the solicitation document, the probability of more realistic RDD's is increased. The more realistic the RDD the less likely it is that the material will be delivered earlier than required or that the contract will become delinquent.

Early delivery as well as delinquent contracts are associated with unrealistic RDD's in government solicitations. These RDD's are the consequence of using inaccurate estimates of PLT in the inventory management models.

In order to remain eligible to receive the contract, a contractor's bid must be responsive to the solicitation. If an unrealistic RDD is incorporated in the solicitation the contractor may bid unrealistically and hope that everything will fall into place in order to meet the RDD. This system feeds upon itself. If there were a reduction in the use of unrealistic RDDs the government would be

receiving material on time more often, rather than earlier or later than requested.

The Navy's ICPs treat the wholesale level inventory management of an item and the procurement of replenishment stocks for that item as separate functions. But both of these functions are key elements of the same supply system and share the goal of maximum fleet support within annual budget constraints. The UICP inventory models determine the reorder level and order quantity based on historical data from the most recent procurements. When the inventory position of an item drops below the computed reorder point, an order is sent to the procurement department to buy the computed reorder quantity. The procurement department then solicits bids from potential vendors. The vendor selected is usually the one who has bid the lowest unit price and can deliver within the ICP estimated desired delivery date. Sometime later the UICP inventory models receive the new price and production lead time values of the vendor winning the contract. A new reorder point and order quantity are then computed and form the basis for the next procurement replenishment stock and the cycle begins all over again.

[10:8]

D. PLT: GOVERNMENT VS INDUSTRY

Private industries have come to realize that inventories are not only costly but can also be used to hide inefficient

operating practices. In response to this recognition private companies are finding new and innovative means to reduce inventories without degrading customer support.[3:iii]

The available data clearly show that the private sector has reduced inventories relative to sales since 1980. In contrast the DOD has experienced a significant growth in inventories relative to customer demands for the same period. About one-half of this growth in DOD peacetime inventories is the consequence of force structure expansion and modernization and to long-needed enhancements to support operational readiness of the forces. The remainder of the growth in DOD inventories is the consequences of the specific management policies of DOD inventory managers and acquisition personnel. The major difference in inventory control procedures between the private sector and DOD is that private industries can more effectively control procurement leadtime thus reducing on-order requirements. They can also order smaller quantities on a more frequent basis to minimize on-hand inventories. This is accomplished through practices not currently found in DOD, such as the negotiation of both price and leadtimes, consolidated procurements, time-phased deliveries, multi-year procurement, and sharing of requirements data with major suppliers.

[3:iii]

In DOD, procurement leadtime at \$15 billion is the largest single element of inventory requirements. Leadtimes have continued to grow since 1980 and are now 3 to 4 times longer than those experienced by private firms for the same or similar material. [3:iii] The other two elements of inventory management, safety levels and operating levels, are also much higher in the DOD than in the private sector. DOD safety levels and operating levels are higher than the private sector because of the increased lengthening of lead times. Inventories on-hand and the quantities on-order are generated by the DOD inventory requirements determination system, which is based on demand, costs, leadtime, and performance goals. Because DOD accepts the existing inventory management determination process, there is a failure to recognize that existing requirements may be high because the basic process of determining requirements results in overstated or excessive quantities. Thus overstated leadtimes can lead to IMs ordering excessive quantities ahead of true needs. [3:1-1]

The actual inventories on-hand and on-order are the result of several factors in the EOQ model used by SPCC. Among the most important of these factors are (a) the inventory requirements, or computed inventory levels, which determine how much inventory is desired, and (b) the accuracy in demand and leadtime forecasts. Inventories in

support of demand of a stochastic nature such as DOD's demand-based requirements determination process are composed of three elements: operating levels based on order quantities, leadtimes-levels based on projected demand during leadtime, and safety levels generated to reduce the probability of a zero balance or not-in-stock position during leadtime. While all have experience growth in constant dollars since 1980, leadtime - the largest single component of the total demand based requirement has grown most rapidly in absolute terms. [3:3-1]

There is great similarity in the actual computational methods used by DOD and private industry for setting operating level and safety level inventories. Differences that do exist arise from the efforts of private industries to control those costs associated with leadtimes. This allows them to reduce both safety level and operating level inventories. The standard economic order quantity methods, coupled with variable safety level computations common to the DOD are found in private sector firms with only minor differences in the customer inventories between DOD and private firms. [3:4-2]

In private industry, leadtimes are not accepted as a fact of life but rather are an integral part of the procurement negotiation process, and material requirements are adjusted to reflect the results of the leadtime negotiation.

The private sector forces production lead times to be as short as possible, and seeks the lowest material cost (not the lowest unit price) in procurement decisions. DOD, on the other hand, accepts long production leadtimes as a fact of life and buys accordingly. As leadtimes grow, the inventory requirements determination process adjusts to accommodate them by increasing the size of the inventory.

[3:4-5; 4-14]

In the DOD inventory management process, the production leadtime is used to determine the amount to buy. The procurement leadtime for routine stock replenishment is seldom an issue as long as it is possible to locate a vendor that will accept the government's required delivery date, which is based on the leadtime forecast. Leadtimes are observed, measured and normally funded in the budget process but not managed. There is no attempt by DOD to reduce leadtimes, they are accepted as a given.

The ever growing administrative leadtimes and production leadtimes represent real costs to DOD and the Services:

- safety levels grow to accommodate the longer production leadtimes to provide protection against the risks of stock-out;
- demand forecasts, made months or years before the requirement is needed become increasingly inaccurate and lead to the acquiring of inappropriate material in the wrong quantities;
- long ALT and PLT create long inventory pipelines and increase the likelihood of over shipments, early shipments and errors in material receiving and storage;

- when material prices are based on time of delivery rather than on time or receipt of an order, lengthy production leadtimes in periods of inflations result in higher costs;
- the existence of extremely long ALT and PLT leadtimes creates a DOD outlay liability of significant proportions especially if actual leadtimes are shorter than estimated leadtimes. [13:5-5] With the coming reductions in budgets more realistic leadtimes are required to ensure that scarce DOD dollars are invested in the correct inventories. In the future DOD will have to maintain operational readiness with ever fewer dollars.

IV. HOLDING-COSTS: A COST OF EARLY DELIVERY

A. GENERAL

Holding Cost, carrying cost, and the cost-to-hold are synonyms for the costs of holding an inventory to meet future demand. In light of the billions of dollars held in inventory throughout DOD it's clear that the inventory carrying costs can be significant. Holding costs may be considered the monetary penalty incurred for retaining inventory to fill future requirements.

The holding cost rate is derived from:

- a. Investment charge: charge for funds invested. This is considered an interest rate. Also, the cost of postponed benefits.
- b. Forecast error and obsolescence: losses due to generation of excess, advancements in technology, etc.
- c. Inventory losses: Adjustments to inventory caused by accounting or physical losses and deterioration.
- d. Storage cost: costs related to storage of material.

Thus holding costs include such factors as obsolescence, interest on capital, losses, handling and storage facilities. [13:8; 14:3; 15:1; 12]

The EOQ calculations used for the centrally managed supply items of the various ICPs within the Services result from the policies established by DODI 4140.39. These policies affect not only the total inventory on hand, but also the total carrying costs incurred as well as the

backorders experienced by the customers. The EOQ equation is the tool used by SPCC IMs to compute their reorder points and reorder quantities. The quantity derived from the EOQ equation provides the most economical quantity to order at one time [14:3]

The primary use of cost-to-order and cost-to-hold is in the calculation of the optimum order size--one which will result in the least total supply cost. The size of such an order is known as an economic order quantity, or EOQ. If the order size is either less than or greater than the EOQ, actual total holding and ordering costs will be greater than the minimum attainable total cost. [16:3]

Under the EOQ model, the order quantity is selected such that the ordering costs are about equal to the holding costs. If the order size is larger than the optimum, fewer orders will be submitted, resulting in lower ordering costs. But the larger order size will produce larger inventory levels, and the increase in holding costs will exceed the savings in ordering costs. Conversely, if the order size is smaller than the optimum, the increase in ordering costs will exceed the savings in holding costs. [16:3]

Item management is done at SPCC and ASO for the Navy. transaction information about an item is provided to the UICP computer each time a transaction involving that item occurs. UICP then determines the status of the inventory. When the

stock level of the item reaches a designated minimum value, a buy quantity is calculated, using the EOQ equation discussed in Chapter III, and the desired quantity is ordered. The basic EOQ computation is similar to the Wilson Lot-Size formula; however derivation of the factors that make-up the formula does vary.

A noticeable difference exists in the calculation of the holding cost between the government and the private sector. Industry normally computes holding cost as a set percentage of the cost of the on-hand inventory for each item in their inventory, while the Navy computes it as a percentage of the total cost of the inventory system. The holding cost and the factors that make up the holding cost are expressed as a percentage of the total cost of the items. The holding cost is a consolidation of the various cost factors required to maintain a certain stock level of items.

DOD has presently established constant rates for opportunity cost (interest rate) and storage cost of 10% and 1% respectively. The factors of obsolescence and loss are costs calculated separately by each Service. The obsolescence factor is included in the computation of EOQ as a damper to decrease the order quantity on items that are becoming obsolete before they can be issued for use. [6:3-24; 14:5]

B. HOLDING COST COMPONENTS

Circa 1959 Harbridge House developed the holding and ordering cost used to calculate order frequency and the reorder points under EOQ. The holding cost thus developed is a yearly rate which is applied to the dollar value of items stocked. The higher the holding cost rate, the lower the quantity of stock desired to have in inventory. [16:3]

The current Navy holding cost rates are (consumables - 23% and repairables - 21%):

	<u>Consumables</u>	<u>Repairables</u>
Investment Charge/		
Discount rate	10%	10%
Obsolescence	5%	5%
Deterioration-Storage	5%	5%
Inventory Loss	2%	1%
Storage Cost	1%	1%
	—	—
	23%	21%

These holding cost rates are currently used by the IMs and SPCC in the determination of economic order quantities. But holding costs rates are only estimates which are based upon separate cost components - general storage cost, deterioration, obsolescence, losses in storage, and interest. DOD has specified the rates themselves or techniques to determine the rates at the wholesale level for each component of the holding cost rate. [15:6-7; 8:5]

C. HOLDING COSTS ELEMENTS

Within DOD's various economic order systems, holding costs represent all variable costs which can be directly attributed to maintaining a given average dollar value of inventory against requirements at any distribution point over a fixed period of time, normally a year. Holding costs therefore consist of the following major elements; (1) storage, (2) interest, (3) losses, and (4) obsolescence.

1. Storage

Under DODI 4140.39, storage costs have been assessed at one percent (1%) of an item's purchase price. Storage costs represent the out-of-pocket costs incurred by the keeping of an inventory and the amortized cost of the storage facilities. DOD arrives at this rate by identifying the various storage operations and obtaining cost estimates for them. The total annual operating cost is divided by the average inventory to yield the 1% holding cost rate decreed by DOD. [17:10]

Storage operations at NSCs and NSDs include activities conducted by the Stock Control Division, the Storage Division, the Inspection Office, and the Transportation Office. Storage operations include all those activities involved in the storage of and issue of supplies from the time the material is placed in storage until it is picked

for issue to consumers. The following can be classified as storage operations:

- a. initial preparation and processing of supplies for storage;
- b. repackaging or reprocessing of items received (when necessary due to improper or defective packaging);
- c. cyclical inspection of supplies in storage;
- d. periodic movement or manipulation of items to prevent deterioration;
- e. preparation for inventory and the maintenance of the stock record accounts;
- f. periodic physical inventorying of stocks;
- g. miscellaneous activities, such as rewarehousing and cleaning and repair of storage facilities. [18:44-46; 79]

The following three elements are relevant to the costing of storage operations:

- direct labor and materials, the costs of civilian and military labor, support supplies and materials, travel and other contractual expenses;
- direct overhead, which consists of administrative and other expenses which are not allocated directly to using activities (accrued leave, government contributions to retirement funds, and group life insurance);
- equipment amortization, repairs, utilities, and depreciation of the physical plant (material handling equipment (ME), office equipment). [18:46]

2. Interest

DODI 4140.11 lists interest as a portion of the holding cost rate. Currently the annual interest costs related to the funds committed to inventories have been assessed at ten percent (10%) of an item's purchase price.

Each dollar of public funds which is invested in DOD inventory represents a dollar of investment in the private sector which is foregone. The interest cost included as a component of holding cost represents the opportunity cost of investment in inventory assets. Interest costs are therefore an important consideration when inventory is to be acquired since a measure of opportunity cost should be included in the decision to purchase this inventory.

3. Physical Inventory Adjustments

While price changes are used in private industry as part of holding costs, they are not part of the computation of DOD holding costs. When inventory losses or gains are found to exist at the time of physical inventory, the inventory losses are a legitimate cost of holding stocks provided they are set off against the inventory increases resulting from the gains discovered during the physical inventory. The new losses computed in this manner represent the costs of deterioration, breakage and spoilage, pilferage and other losses to inventory in storage. [18:83]

4. Obsolescence

The costs attributable to obsolescence are the sum of the loss of the original value of the inventory, plus its allocable share of the cost of disposal operations, less

any return realized from disposal action. This total cost constitutes the obsolescence element of the holding cost rate.

The decision to carry stock at a given inventory level is based on the belief that repetitive demand will be sufficient to exhaust stocks currently being held. However, if the item becomes obsolete because a better item has been procured, or if the item becomes obsolete because a better item has been procured, or if force levels or end items densities decrease, then part or all of the inventory stocked in anticipation of future demand will become excess to the current demand. Thus the money invested in the excess stock, together with the cost of removing it from the supply system, is chargeable as a cost of holding stock. The obsolescent portion of holding cost is based on the actual costs of generating and disposing of excess quantities of stock material against given inventory levels. [18:48]

D. EXCESS MATERIAL

The decision to carry stocks at a given inventory level is generally based on the assumption that future demands will continue at a given rate. However, if the demand drops off unexpectedly much of the stock carried in anticipation of a continued high level of demand will become excess or long-supply material.

One of the major factors to be considered in analyzing the retention of material in long-supply or excess is the cost to hold the item. DOD activities review requirements and on-hand assets periodically to determine if they have excess assets. Assets above requirements are reported to the inventory manager as either total or partial excess in accordance with levels described in DOD Directive 4100.37 [19:7]

Upon receiving a excess report from a reporting activity, the IM compares wholesale requirements and may authorize a return to wholesale stock to fill deficiencies. disposition instructions are made authorizing return for credit, return without credit, or disposal. Upon receipt of disposition instruction the reporting activity either returns the material to a wholesale depot, or turns the material over to property disposal. [19:78] However, within the Navy material is returned to wholesale supply depots before the IM can issue disposition instruction. The usual procedure is to place the material in stock and then report the receipt to the IM. Although the IM may not have any forecasted demands, the receipt and storage expenses have already been incurred by the time the IM receives the report. The item manager's decision, whether to retain or

dispose of the excess material, is thus complicated by the fact that funds have already been expended in bringing the item back into inventory.

The net cost of disposal must be ascertained as a basis for reaching a decision about disposal. Two factors are required to determine the net cost of disposal; the disposal cost per line item and the potential benefit (item usable at a future date) plus the sale proceeds of the remaining material. Each of these factors is affected by the number and value of line items processed for disposal, and these factors are further influenced by the disposal process itself which converts excess supply material into disposal line items. [19:79]

Typically the holding costs of the available units are compared with the costs of repurchasing new items at a later date. If holding costs are higher than repurchase costs for units that would be used at some future date, these units are considered disposable, if not, they are considered to be economically retainable.

Inventory control models such as the Economic Order Quantity (EOQ) model indicate the minimum quantity of an item to be acquired. They do not provide information concerning item quantities to maintain in inventory in the face of changing demands or technological obsolescence, or deleted requirements. Economic retention quantities are defined in

DODI 4140-37 as those quantities of material which it is more economical to retain for future use than to transfer to disposal activities. [17:2]

Thus the purpose of economic retention is to determine which is more economical: to retain or to dispose and reprocure at a later date. The components of the holding cost rate--storage costs, interest costs, and obsolescence costs (which include inventory depletion due to losses and deterioration) need to be considered.

In a retention situation, storage costs assessed at 1% are incurred if an item is retained in inventory and therefore is included as part of inventory holding costs of retention. [17:10]

The annual interest costs related to the funds committed to inventories are assessed at ten percent (10%) of an item's purchase price. A decision to retain an item in inventory does not require additional investments of public funds for purchase of inventory assets. However, the decision to retain an item in inventory precludes the salvage of that item and represents an opportunity cost associated with the salvage value of the item. [17:11]

Obsolescence costs include losses due to technological obsolescence, over-forecasting of requirements, deterioration beyond the point of use, and other causes. The obsolescence cost rate is arrived at by dividing the actual

dollar value of disposed material by the total dollar value of on-hand inventory assets. In a retention situation, the decision involves retaining inventory items that have already been purchased rather than purchasing new items. However, the salvage value which can be obtained from an item may be lost if the item is retained and subsequently becomes obsolete. [17:12]

If a quantity of items above the computed requirements is retained, inventory holding costs are incurred:

Cost to Hold = Storage cost + obsolescence cost of the items to replace those lost to obsolescence
+ opportunity cost of salvage value fore-gone by retaining the items.

Under the economic retention level model, when the cost to order is greater than the cost to hold - retain the material in inventory to meet future demand. When the cost to order is less than the cost to hold - dispose of the material. The economic retention level model is designed only to serve as an aid to management decision making. It is not designed to make inventory management decision. Rather the item manager must decide, aided by the model, the feasibility of maintaining items in inventory for future demand or disposing of those items and reprocuring at a future date.

[17:21]

E. SUMMARY

The varied categories which combine the holding cost rate are:

1. Interest on dollars invested
2. Applicable Stock Control and Financial Control elements at the ICPs
3. Care and Preservation
4. Storage
5. Physical Inventory
6. Deterioration and Shrinkage (Physical inventory adjustment and excess)
7. Obsolescence.

The holding cost rate or the cost-to-hold is applied to on-hand inventory. Errors in lead time estimation lead to errors of overestimation which will result in an excess of on-hand inventory that must be retained or disposed of, to which holding costs are applied. Errors of underestimation result in a deficiency of on-hand assets and can have a damaging effect on operational readiness. [20:43]

V. DATA PRESENTATION AND ANALYSIS

A. STOCK REPLENISHMENT

SPCC's Contracts Completed File was used as a source of data for this thesis. This database contains approximately 14,000 records of procurement actions which were completed before the required delivery date (RDD). The RDD is the contract completion date. In the Contracts Completed File records of completed contracts are kept for three years before they are purged from the data base. A listing of 2,500 early deliveries was generated from the data for the most recent year. This listing contained purchase orders, delivery orders, and "C" type contracts. Since the research effort concentrated on replenishment of inventories, the database was queried for all "C" type contracts completed before RDD. A computer listing with a cut-off of 25 August 1986 (Appendix B) with 545 contracts was generated. These contracts accounted for 3.84% of all contracts contained within the database. This computer listing was then used as source data for the thesis.

The database showed no concentration within any particular group of inventory managers. The IMs ranged across some 200 difference codes distributed throughout the Weapon Systems Support Group: Ships Systems, Combat Systems, and Electronic Systems Departments. The material ranged from

headsets, seals, pumps and valves, to circuit cards and antenna. The material delivered early covered the full range of material managed by SPCC.

Of the 545 contracts delivered early, 246 were completed more than 60 days early. Contracts delivered within 60 days of the RDD were not considered to be significantly early. The 246 contracts had a total value of \$22,865,636. They were broken out as follows:

<u># OF CONTRACTS</u>	<u>DAYS EARLY</u>	<u>VALUE</u>	<u>COST TO HOLD*</u>
1	522	\$ 228,981	\$ 76,365
7	400-521	\$ 2,069,459	\$ 600,512
2	365-399	\$ 21,098	\$ 5,079
2	330-364	\$ 718,530	\$ 156,206
6	300-329	\$ 83,459	\$ 16,556
6	270-299	\$ 444,730	\$ 79,869
7	240-269	\$ 928,200	\$ 149,148
10	210-239	\$ 270,000	\$ 38,281
27	180-209	\$ 2,680,587	\$ 329,382
26	150-179	\$ 1,522,176	\$ 158,265
36	120-149	\$ 2,352,807	\$ 200,150
51	90-119	\$ 6,091,313	\$ 403,028
65	60-89	\$ 5,455,296	\$ 257,819
Sub-			
total	246	\$22,865,636	\$2,470,660
	122	\$10,937,843	\$ 310,155
	177	\$ 9,594,783	\$ 90,690
Total	545	\$43,398,262	\$2,871,505

*Cost to hold is determined by using the center value of Days Early divided by 365 days times the holding rate (23%) times the Value (i.e., $15/365 \times .23 \times 9,594,783 = 90,690$).

The data shows that there are early deliveries, but they must be placed in perspective to the total number of procurement actions and dollars processed at SPCC.

<u>FY</u>	<u>TOTAL</u>	\$ "C" CONTRACTS	"C" CONTRACTS
FY 84	\$1.3 Billion	\$330 Million	2,270
FY 85	\$1.4 Billion	\$373.7 Million	2,969
FY 86	\$1.47 Billion	\$385.2 Million	2,793
TOTAL	\$4.17 Billion	\$1,088.9 Million	8,032

For the fiscal years of 1984, 1985 and 1986 there were a total of 8,032 "C" type contracts worth \$1.09 billion issued. Of this total, 545 contracts worth \$43,398,262 were completed before RDD, with 246 contracts worth \$22,865,636 completed more than 60 days prior to the required delivery date. When a holding cost rate of 23% is applied to the early deliveries a sum of \$2.47 million is generated for the deliveries earlier than 60 days, and a sum of \$2.87 million for all 545 contracts. Consequently, the opportunity cost of early deliveries is approximately \$2.47 million. This sum was spent on inventories that were not required in the amount originally requested because of faulty leadtimes in their requirements computation. These funds could have been better used elsewhere. Thus the opportunity cost lies between \$2.47 and \$2.87 million. They could have been used to procure material not funded, or they could have been used to procure an increased number of critical items. Since the database represents a 3 year period, the \$2.47

million represents .227% of the "C" type contract procurement dollars spent for stock replenishment at SPCC. Early deliveries account for (246 / 8032 = .0306) 3.06% of the total "C" type procurement actions for the same period. Total "C" type contracts valued at \$1,089 million represent (1089 / 4010 = .27) 27% of the total dollars spent by SPCC.

Shelf-life materials are an area of primary concern when considering the consequences of the early delivery of material. None of the 246 contracts delivered early were for the procurement of shelf-life items. Only two contracts for shelf-life material appeared on the listing, and they were delivered 2 days and 48 days ahead of the RDD.

The data revealed no specific pattern of companies or industries which delivered their products consistently early. There were 167 different contractors who delivered 246 contracts early, and the total collection of 545 contracts involved 341 contractors.

From the 246 contracts delivered early at SPCC, the staff code 0502 Weapon System Program Support performed an in-depth review of 27 selected contracts which where delivered 100 days before RDD and valued at over \$100 K each.

Initially, of the 27 items reviewed, four (4) where identified as candidates for long supply. They were "due-in" long supply as opposed to on-hand long supply. However,

upon review by the IMs only one was due-in long supply. The remaining three items were not due-in long supply once the IMs had properly loaded all requirements into UICP. There were no excess inventories created by the early deliveries. Additionally, all items were non-deteriorative in nature (not shelf-life limited). The 27 line items were managed by 24 item managers scattered throughout three departments in the Weapon Systems Support Group: Ships Systems Department, Combat Systems Department and Electronic Systems Department. There were no unusual concentrations in any one department. The contracts were with 27 different companies.

The 27 items were all true early deliveries. The item managers had taken no action to expedite the delivery of any of the material. As far as the IMs were concerned they would be just as happy to have everything come in ahead of RDD. They were all routine replenishment requirements requiring no special attention by the IMs.

Whether an item is awarded competitively or through negotiation has little bearing on early delivery. Of the 27 items: 12 were awarded competitively and 15 were the result of negotiations. Procurement personnel for routine stock replenishment do not normally negotiate the delivery schedule. The normal practice is to use the UICP generated leadtime to compute a required delivery date which is placed in the solicitation that is sent to prospective offerors.

There is little or no incentive for the contractor to agree to a shortened delivery schedule.

B. ITEM MANAGERS

No item manager perceived the early delivery or receipt of supplies/material before the required delivery date as a problem. Early deliveries have a positive connotation to them. IM's believe that contractors who deliver early are good, while late delivering contractors are bad even though in some instances they are the same contractor. If material is delivered early the IM won't have to worry about the inventory position of the item. The IM will not have to expedite an order for the material at some future date. Since none of the material had generated on-hand long supplies, they also didn't have to face the problem of having to decide if excess material existed and whether it should be disposed of or kept. the IM faces more significant daily problems and is therefore not worried about material received before RDD.

The item managers could not identify any instance where the early delivery of material had caused them a problem. They had had unexpected deliveries that had caused problems, but not early deliveries. Unexpected deliveries occur when the stock point is unaware of material due in to their activity because they did not receive a preposition material card. They had had no long supply or excess problems caused

by early deliveries. They had no limited shelf-life material delivered ahead of schedule that had caused problems.

According to the IMs, under normal circumstances the early delivery of material should not cause excess or long-supply. When the system computes requirements it considers total assets, both on-hand and due-in. Therefore, an item would have to have been in due-in long supply prior to going into on-hand long supply. And the item managers do not view due-in long supply as a serious problem.

C. THE COMPANY WHO DELIVERS EARLY

Unrealistically long required delivery dates (RDD) are the primary reason that companies deliver material ahead of RDD. In competitive situations companies normally bid to the RDD. However if the solicitation does present the opportunity to offer an earlier date, some prospective contractors will propose an earlier delivery schedule. But those the researcher interviewed stated that few solicitations provide a desired and a required delivery date format. Rather most solicitations provide a desired and a required delivery date format. Rather most solicitations normally have only a required delivery date. Some contractors stated that they simply respond to the RDD to be competitive, whether it is realistic or not and then produce the items as

best they can, attempting to satisfy the delivery schedule but not feeling undue pressure to meet it. This results in some early and some delinquent contracts.

Negotiated (sole source) and competitive solicitations are handled differently by the prospective contractors. In negotiated contracts the contractors stated that they would inform the contracting officer if they felt the RDD was unrealistic and that they may propose an alternative delivery schedule. Many companies are following a conservative approach in quoting delivery schedules so that they will not end up being labeled a delinquent contractor. Under normal circumstances the delivery schedule for routine stock procurements are not directly addressed during negotiations. Cost is the prime concern in negotiations.

The fear of being declared non-responsive prevents many contractors from taking exception to the proposed delivery schedules. In order to get the business the prospective contractors will make an offer based upon the schedule even if it is shorter than their normal leadtimes and then attempt to meet the delivery date. Most companies who deal on a routine basis with the military have developed their own standard leadtimes which they use when responding to government solicitations. These have grown longer and become more conservative as increasing pressure has been brought by DOD on companies who deliver late.

Those companies with high debt and low cash flow have a strong incentive to deliver whatever they can as soon as possible. One company stated that they were in just that position.

Another company stated that because of their conservative quoting policy they estimated they deliver about 10% of their contracts early and about 50% on time. The rest, even with conservative leadtimes, were being delivered late because of the need to make offers on solicitations which contain unrealistic required delivery dates as computed by the UICP models.

VI. CONCLUSIONS AND RECOMMENDATIONS

A. CONCLUSIONS

Conclusion--The early delivery of material to the government does not cause a serious problem. There is a cost associated with early deliveries. It is costing SPCC at least \$2.47 million for the early delivery of "C" type contracts over a period of three years. However, in perspective this is only .227% of the total value of "C" type contracts awarded (\$1.09 billion).

The Item Managers and Procurement Personnel at SPCC have not considered early deliveries to be a problem. They are so enmeshed in the problems associated with delinquent contracts that the idea that receiving something early is or could be bad is not a consideration. The IMs don't have to worry about expediting the material for some future emergency if a contract is delivered early. As contract management is often in a reactive mode, no attention is directed at early deliveries since they have not caused the customer to complain thus focusing attention on the issue.

Conclusion--Excessive PLT causes early delivery. The true culprit in early delivery and delinquent contracts is the inappropriate procurement leadtimes used by UICP to compute RDDs for stock replenishment. The use of inappropriate procurement leadtimes by UICP generates an ever

higher safety stock level, reorder point and reorder quantities for material which needlessly tie up inventory funds. The IMs and procurement personnel normally accept the computer generated RDDs, and he contractor prices to the RDD and then produces the material in his best interest.

Conclusion--Shelf-life material is not being delivered early. Only two contracts for shelf-life material appeared on the computer listing used for this thesis, and they were delivered 2 and 48 days ahead of RDD.

Conclusion--No company or industry delivers their products consistently early. There were 341 contractors who completed the 545 contracts early.

Conclusion--The contracting method employed, negotiated (sole source) or competitive, has no bearing on early delivery. Of 27 contracts over \$100 K researched indepth: 12 were awarded competitively and 15 were the result of negotiations.

B. RECOMMENDATIONS

Recommendation--Do not amend the FAR to forbid the early delivery of material by contractors. Contract Administrators should not have another set of rules requiring them to monitor yet more contracts as proposed by NAVSEA in Appendix C. They are hard pressed to manage delinquent contracts and manage them mainly by exception. Presently contract administrators must decide where to place their emphasis and which contracts will receive attention. While

early contracts have a cost attached, they do not have a directly negative impact on fleet readiness. While they do use scarce resources that may be better employed elsewhere, delinquent contracts have an immediate adverse affect on fleet/operational readiness.

The forbidding of early deliveries would send the wrong type of message to private business. All too often we are trying to expedite material ahead of schedule because of changing requirements, and to now come out and say we don't want it until the RDD would be counterproductive. This could become another factor which further lengthens lead-times and which would increase the size of the inventory, raise reorder points and reorder quantities even higher.

Recommendation--Amend the FAR to create a window of delivery and a delivery clause for inventory replenishment. The ultimate aim of the Navy's ICPs is to get the appropriate material delivered to the right destination on time. This can be accomplished by establishing realistic delivery schedules. the government must put an end to the unrealistic required delivery schedules generated by the UICP models for the routine replenishment of inventory stocks. The government must also encourage prospective contractors to submit delivery schedules that they can realistically meet, whether

they are earlier than or later than the proposed (desired) delivery date.

Therefore those portions of the FAR (Part 12 and 52) which deal with delivery schedules must be modified. The first step would be the creation of a 60-day window around the RDD - contracts completed within 60 days of the RDD were not considered to have delivered on time if he delivers within this window. The second step would be the development of a delivery clause for routine stock replenishment of inventories similar to that proposed in Appendix D. This will encourage offerors to propose realistic delivery schedules with phased or incremental deliveries to meet a desired delivery schedule.

In most cases the RDD established for routine stock replenishment is not really a required delivery date generated by a specific need, but rather it is a delivery date based on historical data in the computer which may or may not reflect the current situation. Changing the lead-times will change the safety level, the reorder point and reorder quantities thus freeing scarce funds for items which have true long leadtimes.

Recommendation--Delivery schedules should be negotiated. DOD should follow the example of private industry and actively negotiate the delivery schedule as well as the price with prospective contractors. SPCC currently has a

pilot study underway to see if the negotiation of RDD and price are feasible in today's procurement environment.

C. ANSWERS TO RESEARCH QUESTIONS

What effect does the early delivery of material have on managements ability to control expenditures? There is no effect on managements ability to control expenditures. The costs involved accounted for only .227% of total funds expended.

Are early deliveries an extensive problem with certain industries or products? There is no industry or company which consistently delivers early. There are no particular products which are delivered consistently early.

What are the positive and negative affects on DOD's ability to manage inventories? The early delivery of material does not affect DOD's ability to manage inventories. The early deliveries account for only 3.06% of the total "C" type contracts issued.

Would contract clauses specifying window delivery schedules be an effective means of dealing with early delivery? The creation of window delivery schedules is one means of dealing with early deliveries.

D. AREAS FOR FURTHER RESEARCH

Further research in the area of early deliveries should be directed towards the Defense Logistic Agencies and

General Administrative Services. Their material may be more susceptible to early deliveries than Navy managed materials.

Further research should be conducted in the area of the early delivery of sole source negotiated materials.

Further research should be conducted in the relationship between early delivery and procurement leadtimes.

E. SUMMARY

In summary, early deliveries do occur. There are no shelf-life problems at SPCC associated with early delivery. There are opportunity costs incurred in the holding and paying for material delivered early. The true culprit in early deliveries are inappropriate procurement leadtimes used by the ICPs in computing in RDDs for stock replenishment leading to larger inventories and higher reorder points and quantities.

APPENDIX A
NAVSEA PROPOSED CHANGES TO THE FAR

This appendix contains NAVSEA's recommendations for amending the FAR Part 12 and 52 to prohibit the early delivery of material and services specifically allowed in the contract.

12.104 is amended by adding the following:

(4) The contracting officer shall insert in solicitations and contracts for supplies or services a clause substantially the same as the clause at 52.212-xx, Accelerated Deliveries of Supplies and Services. The clause permits accelerated deliveries under the contract for only those supplies or services specifically enumerated within the clause.

Part 52 - SOLICITATION PROVISIONS and CONTRACT CLAUSES

52.212 is amended by adding the following:

52.212-xx Accelerated Deliveries of Supplies and Services.

As prescribed by FAR 12.104(4), the contracting officer shall complete and insert a clause substantially as follows in solicitations and contracts for supplies or services. The clause invokes certain prohibitions against the early delivery of supplies or services.

ACCELERATED DELIVERIES OF SUPPLIES OR SERVICES

(a) Supplies/Services tendered for acceptance fifteen calendar days or more prior to the contract delivery date will be processed at the discretion of the contracting officer using one of the procedures provided below, except for those supplies/services enumerated in (b) which may be delivered at any time prior to the delivery date.

1. Supplies/Services will not be accepted if tendered at origin or if acceptance is at destination they may be returned by the government at contractors expense.

2. Supplies/Services will be accepted but invoices will not be processed for payment until after the contract delivery date. The government will still be entitled to any prompt payment terms offered by the contractor for those supplies/services accepted early. The prompt payment term period shall begin from the contract delivery date or receipt of an acceptable invoice whichever is later.

3. Supplies/Services will be accepted and the government will deduct from the contractors invoice, in addition to any other terms offered, the Current Treasury Interest Rate for 6 month bills. The contract will be modified to reflect these deductions.

(b) Accelerated deliveries under this contract may be made only for those items listed below.

Item	Qty	Delivery Date	Ship To	Mark For
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APPENDIX B
CONTRACTS COMPLETED BEFORE RDD

The 545 contracts contained in this appendix form the database for this thesis. It is a computer listing of 'C' type contracts from the Contracts Completed File at SPCC that were completed before RDD. The following information is contained in the listings:

1. PIIN: The contract number.
2. NIIN: Last nine digits of the National Stock Number purchased under the contract.
3. PURCH DATE: Date (year and number of days) of the award of the contract.
4. RDD: Required Delivery Date.
5. CONT. COMP: Date (year and number of days) contract completed.
6. EXT DOL: Dollar value of the contract.
7. FSCM: Manufactures code of the contractor.
8. LRC: Inventory managers code at SPCC.

PIIN	NIIN	PURCH_DATE	ROD	CNT_COMP	EXT_DOL	FSCM	ERC
DAA80764CE471	010909439	54143	55282	55203	64500.00	73293	PB5TN
F4160884CC363	003900867	34343	55151	55139	30022.80	5T0U2	GUHSE
F4250084C0967	010533121	54172	55293	55223	220593.00	70214	
M0A90464C3026	010455103	54157	55273	55329	1551.35	24584	LC/TY
N0010463CK359	010504713	53503	54210	54170	54735.00	52808	EX4SN
N0010463CK373	010515449	53265	55105	54202	32700.00	59790	GSGSE
N0010463C0121	011113270	53542	54341	54302	444999.90	70508	GRUSU
N0010463C2592	000894270	34011	55354	34224	13144.00	2X441	CETSV
N0010483C4285	004520465	54199	55181	55179	26971.00	55110	MVFS6
N0010483C5755	010543208	53542	54245	54166	51548.00	59790	GSGSE
N0010463C7004	LLTRS6051	53319	55055	55052	43000.00	95092	
N0010454C5026	000752179	54072	54310	54302	521.72	02004	CY4S2
N0010464C3029	010755165	54075	54255	54224	1550.00	55092	CY4S2
N0010484C3094	010243283	54259	55075	55002	492.80	34260	CY4S2
N0010464C0013	010524337	53533	54260	54241	40270.52	47440	GYGSE
N0010434C0025	002092024	53555	55274	85172	1714510.02	54104	GNSSF
N0010464C0033	000240306	54019	54319	54138	25500.00	3G271	GPFSU
N0010484C0034	002212446	54047	55297	55201	20407.00	12272	GXASF
N0010464C0042	010552573	54129	54240	54237	55525.00	54537	GN5SL
N0010464C0052	001416659	54258	54503	54353	54760.00	59747	GPESD
N0010484C0057	007200572	54007	55001	54282	20708.00	56271	GPESD
N0010464C0052	010267823	54130	55150	55122	55900.00	59180	GPESD
N0010464C0065	011653705	54150	54555	54289	646.50	41620	CVC54
N0010484C0068	004932013	54090	54506	54276	107865.00	52081	GPCHM
N0010484C0059	LLTRS3904	54200	55051	55017	53801.00	77081	
	LLTRS3906	84200	55051	55017	53801.00	77081	
	LLTRS3910	84200	55051	55017	53801.00	77081	
	PNJUL5199	54206	55051	55017	53801.00	77081	
N0010484C0077	LLHDNR446	54167	54349	54325	76000.00	6K281	
	LLHDNR447	54167	54349	54325	76000.00	6K281	
N0010484C0123	010650297	54220	55041	55014	220155.32	55453	GWASF
N0010484C0136	010606930	54242	55241	55233	33924.40	97578	GXASF
N0010484C0137	010299169	54249	55109	55091	45815.00	53206	HFAFH
N0010484C0235	001024071	54012	55180	55027	11862.00	34889	CVC54
N0010484C0275	004134529	54023	54523	54282	28168.00	03070	
N0010484C0290	009053863	54031	55110	55060	182258.00	99657	GLPSB
N0010484C0318	002432357	54048	55217	54293	65058.00	17903	GEBSA
N0010484C0326	011054402	54055	55213	55149	54600.00	2X411	HS8SJ
N0010484C0341	008028583	54378	55292	55238	25058.00	54207	
N0010484C0344	007804442	54068	55008	55201	57673.00	59180	HHASH
N0010484C0364	003720839	54095	55039	54323	32000.00	3N183	GNDSD
N0010484C0367	001531426	54096	54310	54224	31902.00	31100	GBUSA
N0010484C0440	008028583	54188	55065	55046	57508.00	51966	
N0010464C0459	002767865	54197	55151	55113	156458.99	25223	GLESB
N0010484C0465	007690949	54202	55010	55004	101414.40	5N865	
N0010484C0474	006010966	54197	55016	55238	51739.70	00912	
N0010484C0531	010847844	54233	55155	55154	113928.90	55230	GLDSB
N0010484C0566	009055062	54333	55247	55201	154600.00	57412	GAJASF
N0010484C0609	009100997	54265	55020	55183	24178.00	50801	GAESA
N0010484C0616	009100993	54205	55020	55183	24178.00	55001	GAESA
N0010484C0626	008514004	54265	55112	55003	112243.00	1M142	GEBSA
	009029753	54273	55027	55233	461674.00	55260	UNBSH

PIIN	NIIN	PURCH_DATE	ROU	CONT_COMP	EXT_DOL	FSCM	LRC
N0010434C0860	002158513	04244	05149	05091	43134.00	95335	HFA SH
N0010434C0870	007439301	04031	05085	04221	74170.00	12447	HQ2 SJ
N0010434C0880	010526611	04041	04502	04290	1136.54	26210	GLE SB
N0010434C0903	007301723	04080	05290	05214	57432.00	02657	HEG SH
N0010434C0906	005497268	04097	05150	05349	26330.00	95402	HEF SG
N0010434C0907	004771107	04055	05065	04241	75210.00	06052	HEG SH
N0010434C0923	002552193	04091	04553	04233	55465.80	05997	HEG SG
N0010434C0934	011081583	04259	05173	05154	29422.19	51302	HRS SJ
N0010434C0951	010924400	04138	05227	05201	57857.00	03657	HEG SG
N0010434C0963	006736505	04170	05358	05201	228691.00	03657	HEG SH
N0010434C0971	009142241	04222	05097	05077	35373.00	71871	HS8 SJ
N0010434C0983	010864577	04181	05270	05195	445049.00	05857	HFA SH
N0010434C0986	005316030	04134	05058	05035	16344.50	28003	H48 SJ
N0010434C0989	010247353	05007	05232	05201	32055.00	05110	HB8 SG
	010247474	05007	05232	05201	32055.00	05110	HB8 SG
	010247844	05007	05232	05201	32055.00	05110	HB8 SG
	010247849	05007	05232	05201	32055.00	05110	HB8 SG
	010247352	05007	05232	05201	32055.00	05110	HB8 SG
N0010434C1012	009645465	04203	05325	05245	29322.00	72757	H48 SJ
N0010434C1024	010255682	04214	05050	05077	73200.00	59160	HFA SH
N0010434C1030	012272952	04269	05050	05074	73200.00	22501	HFA SH
N0010434C1077	010861377	04254	05109	05105	238920.00	00047	HSC SJ
N0010434C1091	011700929	04250	05340	05272	20010.00	05857	HMASH
N0010434C1094	009906168	04248	05273	05223	104194.91	9M218	HS8 SJ
N0010434C1124	009771107	04358	05154	05120	106725.00	08032	HEG SH
N0010434C1145	011468808	04259	05304	05160	92800.00	01551	G88 SA
N0010434C1150	010561228	04259	05259	05201	83220.00	05057	HFA SH
N0010434C1179	011645000	04272	05259	06062	27060.34	9N865	CV8 S4
N0010434C1208	000528903	04273	06152	05272	17500.00	34270	HEB SG
N0010434C1310	010954806	05354	04251	04248	1075.00	9Y422	HVC SO
N0010434C1387	004316769	04044	04355	04340	56000.00	52659	HVD SO
N0010434C1411	008549719	04097	08310	05017	17500.14	98441	HVASO
N0010434C1443	004716875	04151	06031	05105	19500.31	0R047	HQ6 SO
N0010434C1491	010948208	04165	06164	06068	3675.00	0R047	WF4 W9
N0010434C1496	005738295	04188	05023	05017	16000.00	71905	HVD SO
N0010434C1521	006510181	04199	05060	05027	22659.06	01275	HVASO
N0010434C1555	011600414	04227	05172	05092	278060.00	02005	HVM SO
N0010434C1562	006102805	04228	05074	05071	34307.00	53154	GF8 SO
N0010434C1588	010603530	04253	05172	05169	57052.63	9U034	HVC SO
N0010434C1594	010392681	04254	08014	06076	33630.00	0R047	HVM SO
N0010434C1617	010942935	04259	06044	05201	108628.00	06546	HVC SO
N0010434C1625	000568780	04259	05343	05139	47820.00	06546	HVC SO
N0010434C1639	011192487	04259	06241	06168	51230.00	0R047	HVM SO
N0010434C1641	001225659	04268	05304	05300	58260.00	98441	HVASO
N0010434C1670	004641141	04273	05248	05223	23484.00	52659	HVD SO
N0010434C1684	011222597	04273	05083	05062	11438.00	52250	HVX SO
N0010434C1805	011062803	05352	06049	06027	28550.00	00641	AA4 SS
N0010434C1817	01J517905	05350	05265	05238	355440.00	05990	CW8 S2
N0010434C1827	010292572	03347	05054	04302	6909.00	59475	AK1 SU
N0010434C1836	007647176	04200	05060	05076	190542.92	07256	DYLSY
N0010434C1861	000122061	04051	05071	05271	294700.00	7M670	AT4 SK
N0010434C1905	009143724	04160	05184	05139	480.00	05052	BUDSK

PIIN	NIIN	PURCH_DATE	RUC	CONT_COMP	EXT_DOL	FSCM	LRC
N0010484C1912	004580655	84147	85251	85055	1058.00	59475	AC1SS
N0010484C1927	009431059	84257	85200	85190	1230.00	57800	AS4SR
N0010484C1949	007783032	84165	85129	85062	5190.40	32872	AA4SS
N0010484C1955	005022028	84177	85071	85042	23504.00	50293	AHSST
N0010484C1960	001660203	84258	85177	85106	1551.00	59475	AD4SS
N0010484C1965	010329077	84192	85247	85223	145507.20	14402	UNASL
N0010484C1967	J10942492	84273	85207	85077	40500.00	25034	WJ4WS
N0010484C1977	004383209	84257	85271	85105	1992.00	59475	AD1SS
N0010484C1981	J01725866	85082	86137	86062	3050.00	59475	AC1SS
N0010484C1984	010225890	84214	85204	86100	24600.00	52092	AA2SS
N0010484C1995	001563282	84305	85300	85240	3752.00	59475	AD4SS
N0010484C2013	010596221	84270	85340	85280	3500.00	59475	ACLSS
N0010484C2029	010292576	84331	85355	85321	6720.00	59475	AK1SU
N0010484C2046	0005531920	84232	85320	85210	51043.00	23144	EXJSN
N0010484C2062	001651423	84291	85235	85260	4785.00	59475	AD4SS
N0010484C2074	002480840	84355	85320	85314	754.00	59475	ATCSR
N0010484C2076	010409382	84356	86065	86065	2800.00	20284	AK1SU
N0010484C2077	010047169	84243	85313	85280	15590.00	59475	ATCSR
N0010484C2091	010660160	84257	85350	85232	104614.00	90341	AJ1ST
N0010484C2113	006248293	85347	84222	84201	38375.00	30223	CP0SX
N0010484C2157	010395285	84061	85155	84352	8990.40	32372	CF0SV
N0010484C2162	010628317	84107	85141	85128	1400.00	55302	CF0SV
N0010484C2169	010317486	84107	85171	84289	3153.60	12166	CF0SV
N0010484C2230	010292550	84259	86180	86140	2124.00	32904	CF0SV
N0010484C2260	010317537	84257	85344	85132	2559.30	35805	CF1SV
N0010484C2203	011062817	84209	85319	85303	7800.00	00641	
N0010484C2512	011497132	84258	85190	85145	54720.00	01450	BS8SU
N0010484C2504	003203002	84259	85259	85254	122861.49	14058	DEZSW
N0010484C2537	012030887	85073	85313	85263	1060672.00	29430	ETZSM
N0010484C2650	011738044	84060	84280	84270	25141.40	33362	KAASW
N0010484C2740	004214357	84194	86005	85349	37751.01	50549	DS4SY
N0010484C2767	008475412	84210	85290	85133	6022.80	20723	DEZSW
N0010484C2776	010759973	84244	85328	85272	736400.00	10765	KRZHS
N0010484C2794	011137625	84250	85350	85201	19992.00	57453	ETHSM
N0010484C2797	011581232	84271	87059	86176	820571.98	71483	KAAY1
N0010484C2855	010742393	84145	85209	85201	554.18	59475	PQ4TQ
N0010484C2854	000750525	84255	85180	85123	48825.00	51143	EE3SP
N0010484C2866	011575180	84171	85108	85097	20709.00	31210	LUBTC
N0010484C2927	007750102	84222	85222	85190	21285.00	27594	PY5TR
N0010484C2950	007314404	84220	85270	85223	20905.00	84740	EE1SP
N0010484C2958	010373297	84244	85237	85201	11900.00	05594	
N0010484C3028	010344731	84200	84350	84302	27434.00	56742	PV5TQ
N0010484C3103	010956800	84110	84200	84241	51192.00	54971	PW+TQ
N0010484C3110	009373289	84311	85350	85272	30810.00	59244	PGATN
N0010484C3112	011909644	84159	84300	84291	563290.14	80009	PYATR
N0010484C3142	012021388	84159	84300	84291	605290.14	80009	PYATR
N0010484C3152	011021444	84255	85071	85071	173528.75	14051	PY5TR
N0010484C3153	LLHMM0680	84259	86074	85300	108300.00	16379	PSFTN
N0010484C3155	LLHMM0881	84259	86074	85300	108300.00	16379	PSFTN
N0010484C3165	002890249	84259	85155	85035	7108.56	70690	PZ4TK
N0010484C3169	001516741	84250	85072	85042	30000.00	02040	PR4TC
N0010484C3171	010168204	84179	85240	85214	401549.20	80009	PY5TR

PIIN	NIIN	PURCH_DATE	RDC	CONT_COMP	EXT_DOL	FSCM	LRC
N0010484C3220	011015341	84271	85350	85197	53523.99	56034	LE6TL
N0010484C3254	000452593	85010	85280	85196	2021.85	97138	POATN
N0010484C3272	004501494	84250	85230	85238	74155.00	86014	PCSTN
N0010484C3273	010529120	84271	85142	85162	857952.00	12050	PR4TQ
N0010484C3304	000532793	83352	85015	85014	9690.00	8041	RH3TY
N0010484C3311	005002859	84032	85102	85047	1550.00	55302	RF2TU
N0010484C3352	012111910	84191	85257	85201	46559.00	57761	RUOTW
	012111911	84191	85259	85201	46564.00	57761	RUOTW
	012111912	84191	85257	85201	46569.00	57761	RUOTW
	012111913	84191	85259	85201	46569.00	57761	RUOTW
	012111914	84191	85259	85201	46569.00	57761	RUOTW
	012111915	84191	85259	85201	46569.00	57761	RUOTW
	012111916	84191	85259	85201	46569.00	57761	RUOTW
	012116390	84191	85259	85201	46569.00	57761	RUOTW
N0010484C3356	011928067	84177	85507	85030	13471.66	18555	RL2TV
N0010484C3357	010975232	84200	85105	85083	40802.00	04839	RA2TU
N0010484C3364	011253355	84209	85128	85118	7403.00	29078	RL2TV
N0010484C3365	012002571	84209	85204	85190	24804.00	46341	RB2TU
	012128703	84209	85204	85190	24804.00	96341	RE2TU
N0010484C3388	010222995	84254	85173	85041	52780.00	90341	RB2TU
N0010484C3398	011213122	85173	86113	86039	34794.20	78752	RL3TV
N0010484C3711	010654910	83349	84204	84139	57200.00	20019	HR8SJ
N0010484C3779	LLHE40198	84320	85251	85163	42280.00	88748	GXASF
N0010484C3928	004535764	84268	85099	85231	18812.00	09657	HFJSH
N0010484C3936	010336669	84229	85305	85263	96203.43	25034	CWASZ
	010608173	84229	85305	85203	96203.43	25054	CHCSL
N0010484C4127	010158025	84013	84373	84241	47939.64	52507	JXE73
N0010484C4132	011129799	84220	86112	86105	33986.00	31143	JXV73
N0010484C4143	003773120	84041	85217	85035	19720.00	2P464	JXU73
N0010484C4167	011058333	84233	80102	86084	27744.00	11859	JX373
N0010484C4190	011590407	84298	85344	85329	32905.00	30056	JXF73
N0010484C4207	011580510	84301	85200	85190	67995.30	95181	JXM73
N0010484C4221	010655605	84187	85319	85175	224754.00	21950	JXV73
N0010484C4224	004001069	84194	85171	85132	52722.00	00002	JXE73
N0010484C4225	011655692	84201	85152	85050	36650.00	1E012	JXD73
N0010484C4242	001810830	84215	85179	85105	62048.48	40912	JXF73
N0010484C4298	002345989	84258	86082	86035	1733389.00	99517	JXG73
N0010484C4300	011110790	84266	85287	85209	32400.00	2P404	JXF73
N0010484C4504	005512219	84264	85319	85300	25752.16	02951	JXF73
N0010484C4400	010903741	84250	85151	85094	77879.00	02750	EXCSJ
N0010484C4422	010293962	84258	85067	86062	20855.00	0V209	AA4SS
N0010484C4428	010292597	85073	86158	86019	547.00	5475	AK1SU
N0010484C4432	010292557	84334	85250	85201	1305.90	9N010	AK1SU
N0010484C4433	001770200	84330	85553	85314	2115.00	59475	AC1SS
N0010484C4502	002252389	84333	85330	85243	1575.00	57183	PDATN
N0010484C4528	004696997	84283	85248	85190	17601.36	1Y156	PW4TQ
N0010485CB013	007005114	80152	85282	85215	10359.77	6A423	CY45Z
	007005821	80102	85282	85215	10359.77	6A453	CY45Z
N0010485CB054	011275143	85162	85104	86049	1794.50	54027	CY45Z
N0010485CB088	010714415	85311	80500	86216	411.40	35502	CY45Z
N0010485CB093	007457859	85000	85210	85233	5370.00	51828	LY45Z
N0010485CB101	009370000	85010	85355	85124	2304.86	70591	CY45Z

PIIN	NIIN	PURCH_DATE	RDC	CONT_COMP	EXT_DCL	FSCM	LRC
N0010485C3115	010714579	85273	86163	86108	996.99	86605	CY4SZ
N0010485C8116	010678142	86010	86395	86199	875.10	82805	CY4SZ
N0010485CC032	011015890	85270	85300	85349	32094.00	32770	HRS SJ
N0010485C0010	010578647	84354	85350	85201	98600.00	12511	GRGSE
N0010485C0031	010395751	84353	86013	86303	50859.00	86380	GRHSE
N0010485C0101	011071170	85100	86220	86009	39242.00	31361	GWD SF
N0010485C0109	001521115	85121	86230	86204	35410.00	10171	HFB SH
N0010485C0112	010463960	85121	86245	86094	20190.00	89513	GRHSE
N0010485C0196	003775807	85240	86219	86120	95875.00	8X074	GPGSU
N0010485C0199	0006050302	85241	86230	86158	2619.70	81212	GPBSD
N0010485C0231	0006051620	85273	86206	86049	69429.35	85445	HHASA
N0010485C0240	LLHUP4110	85290	86290	86124	174210.00	82804	GNFSU
	011769814	85290	86290	86124	174210.00	82804	GNFSU
	011773223	85290	86290	86124	174210.00	82804	GNFSU
	011773721	85290	86290	86124	174210.00	82804	GNFSU
	011778723	85290	86290	86124	174210.00	82804	GNFSU
	011778724	85290	86290	86124	174210.00	82804	GNFSU
	011778725	85290	86290	86124	174210.00	82804	GNFSU
N0010485C0305	004064760	84283	85150	85097	25205.25	8M339	KAASU
N0010485C0310	010714564	84283	85208	85252	93586.50	82750	HQB SJ
N0010485C0312	009524779	84292	85140	85139	7222.00	91543	GLFSB
N0010485C0316	011728934	84297	85273	86215	41914.00	52374	GLFSB
N0010485C0339	004642500	84339	86008	85322	45040.80	34494	
N0010485C0352	011599377	84352	86070	85118	14751.20	20200	GLESB
N0010485C0355	007677209	84354	85230	85220	35700.00	93591	GNBSD
N0010485C0357	010253354	85025	86030	85201	403454.20	95802	GNCSH
N0010485C0359	002867511	84356	85271	85263	22296.00	85130	GLESB
N0010485C0370	005719005	85007	85227	85201	21303.97	78730	GNBSD
N0010485C0375	005594655	85077	86153	86005	77937.00	89135	GBBSA
N0010485C0386	010337238	85031	86040	85252	41760.00	13046	GLESB
N0010485C0395	012355807	85032	85272	85160	64000.00	80529	GPCSD
N0010485C0431	010082152	85053	85353	85322	99443.00	71023	GBBSA
N0010485C0435	002644515	85071	86001	85342	18900.00	89990	KAASA
	002644517	85071	86001	85342	18900.00	89990	KAASA
N0010485C0462	008028314	85079	86014	85329	64260.00	50188	GBBSA
N0010485C0503	009551407	85102	86015	85300	31519.04	80293	GLFSB
N0010485C0590	000804463	85281	86129	86068	86256.36	86442	PZ4TK
N0010485C0605	001611749	85158	86053	86014	7877.10	50601	GAASA
N0010485C0613	002673037	85169	86014	86151	66046.00	64557	GLESB
N0010485C0628	010529557	85178	86103	86089	65680.00	13040	GLESB
N0010485C0636	000726983	85294	86229	86215	50567.00	16712	GPSSD
N0010485C0681	010216093	85317	86365	86185	28550.03	87309	GXASF
N0010485C0713	011068965	85253	86269	86210	21532.00	84409	GLESB
N0010485C0744	011442822	85280	86218	86105	48578.00	85991	HQASU
N0010485C0917	011112350	85057	86259	86089	61950.00	59556	KAASH
N0010485C0955	003512228	84325	86065	86002	21910.09	26003	HQB SJ
N0010485C0965	011349332	84340	86230	85150	21445.20	51729	HFFSF
N0010485C0968	011181405	84340	86225	85218	39142.92	95502	HFM SH
N0010485C0977	003466677	84350	85233	85207	29970.00	7A080	HFB SH
N0010485C0987	003951692	84361	86271	86094	27112.50	47557	HFB SH
N0010485C1006	010509214	85004	86004	85252	55700.00	83657	HEGSH
N0010485C1022	010511812	85070	86070	85272	51740.00	83807	HEGSH

PIIN	NIIN	PURCH_DATE	RDO	CNT_COMP	EXT_DCL	FSCM	LRC
N0010485C1040	011700994	85032	85273	85089	15780.00	63657	HFBSH
N0010485C1050	008159582	85057	85337	85305	72912.00	04579	HEGSH
N0010485C1055	01142032	85050	85140	85089	79575.00	03607	HFMSH
N0010485C1127	010975472	85115	85305	85272	55477.54	53038	HS3SJ
N0010485C1139	011546566	85135	85070	85305	26380.00	30793	HFMSA
N0010485C1140	011442033	85130	85135	85027	40140.00	33537	HFMSH
N0010485C1143	010570473	85125	85117	85105	51355.00	00062	HSASJ
N0010485C1153	004522729	85150	85044	85027	58103.00	1w505	HEGSD
N0010485C1155	011442033	85023	85270	85215	55120.00	63857	HFMSH
N0010485C1159	007732786	85140	85035	85015	29327.13	12497	HE3SJ
N0010485C1173	009090407	85280	85005	85049	55990.64	15187	HEFSH
N0010485C1186	010740929	85151	85140	85075	58324.00	00062	HSASJ
N0010485C1199	007525153	85165	85305	85294	170097.00	35793	HEGSB
N0010485C1220	006262420	85183	85098	85305	21373.29	22303	HE3SA
N0010485C1223	001545335	85210	85005	85009	94322.40	15309	GRLSE
N0010485C1229	007717269	85239	85234	85084	151370.65	15309	HSASJ
N0010485C1253	004560836	85214	85209	85133	99300.00	28199	HSASJ
N0010485C1256	006472777	85281	85270	85191	82607.00	30086	HCDSJ
N0010485C1259	002156613	85232	85167	85303	45134.00	95335	HFASH
N0010485C1283	010509780	85248	85240	85124	77155.00	55857	HEGSH
N0010485C1292	011136975	85239	85343	85181	57167.00	55423	HSASJ
N0010485C1298	010881377	85202	85257	85202	157577.00	60047	HSCSJ
N0010485C1320	011083138	85255	85250	85153	26392.00	56425	HSASJ
N0010485C1336	006262420	85257	85102	85322	62705.96	22308	HE3SA
N0010485C1341	009142241	85201	85090	85075	58291.00	71871	HS3SJ
N0010485C1359	011110221	85364	85210	85168	26250.00	5H654	HSCSJ
N0010485C1371	004827191	85264	85179	85120	40560.00	07652	HSASJ
N0010485C1380	011047387	85005	87000	85190	46242.00	63657	HE3W
N0010485C1391	0100673355	85273	85108	85064	71040.00	58874	HEDSH
N0010485C1399	011338073	85273	85350	85176	231075.00	15520	HFHSH
N0010485C1403	000455430	84290	85100	85113	5390.00	9R903	GFCSe
N0010485C1414	011704377	84305	85141	85013	55157.00	20330	HVJSO
N0010485C1416	010343642	84311	85274	85068	25550.00	4Y069	HVCSo
N0010485C1435	PNMAR5087	85063	85233	85215	4650.00	17062	
N0010485C1443	009044736	85053	85203	85190	3045.00	4Y069	GFCSo
N0010485C1450	011300118	85007	85247	85201	42570.00	1Y025	HVESO
N0010485C1461	010391875	85503	85213	85175	5500.00	4Y069	GFCSo
N0010485C1464	010166028	85007	85192	85300	13545.44	28553	HVJSO
N0010485C1471	009292740	85017	85299	85277	28850.00	17062	HVDSO
N0010485C1477	010362205	85025	85243	85190	69258.00	4Y069	GFDSo
N0010485C1490	0104353493	85030	85031	85027	57915.00	57574	HVKSO
N0010485C1508	003670788	85036	85275	85238	4392.80	27424	GFDSo
N0010485C1512	0056000845	85044	85212	85203	73750.00	4Y069	GFCSo
N0010485C1520	000455752	85056	85365	85124	25050.00	52659	HVCSO
N0010485C1545	003931710	85122	85352	85321	26400.00	55159	HVASO
N0010485C1630	007605883	85134	86039	85321	14151.00	11659	HVDSO
N0010485C1718	000532066	85171	85040	86035	46771.43	7V760	GFCSo
N0010485C1771	004335994	85333	85178	85120	44589.30	13669	HVESO
N0010485C1772	010624573	85281	85193	85215	51071.04	9U064	HVCSo
N0010485C1880	010474854	85250	85161	85146	4739.28	2K305	HVKSO
N0010485C1884	011521251	85250	85132	85120	16752.50	9U564	HVJSO
N0010485C1903	004213143	85011	85090	85075	5202.82	2U284	AC1SS

PIIN	NIIN	PURCH_DATE	RDO	CONT_COMP	EXT_DOL	FSCM	LRC
N0010485C1906	008160492	84539	85294	85201	552.60	33362	AS4SR
N0010485C1912	008652831	84539	85303	85280	1088.00	59475	AD1SS
N0010485C1931	009189139	84505	85031	85305	5905.00	60479	AA0SS
N0010485C1937	010292593	85005	85303	85231	644.07	9N610	AK1SU
N0010485C1943	010226799	85045	85080	85035	3810.00	59475	AC1SS
N0010485C1960	011135079	84547	85157	85075	41291.25	53497	AA1SS
N0010485C1962	007090784	85057	85277	85201	5348.00	29075	AA4SS
N0010485C1964	010543055	84505	85007	85039	25050.00	55750	ATCSR
N0010485C1967	001182445	84552	85200	85238	58910.00	30223	
N0010485C1971	001863423	85073	85038	85329	5350.00	59475	AD4SS
N0010485C1987	013293966	85050	85255	85349	47173.92	9N610	AA4SS
N0010485C1995	010592794	85102	85257	85263	57678.00	50875	KA1SS
N0010485C2025	000708200	85079	85003	85321	68042.20	3F272	AC1SS
N0010485C2029	010060394	85079	85149	85068	28785.00	55475	ATCSR
N0010485C2035	009694721	85115	85080	85062	5754.00	55260	AC1SS
N0010485C2040	001395007	85082	85043	85151	40200.00	6U479	BM0SN
N0010485C2044	010066504	85087	85267	85075	57905.00	09448	AMMST
N0010485C2046	0000379723	85092	85352	85252	78030.00	12598	AC1SS
N0010485C2074	005937817	85155	85305	85287	53760.00	6U647	AA2SS
N0010485C2081	010292597	85200	85195	85160	2100.54	9N610	AK1SU
N0010485C2107	010268359	85105	85240	85019	9065.00	32872	KAAS
N0010485C2132	010292577	85303	85298	85189	4732.00	59475	AK1SU
N0010485C2136	001851418	85290	85021	85189	5504.00	59475	AD4SS
N0010485C2142	010989038	85190	85102	85091	60175.83	6U479	BRASN
N0010485C2155	005132373	85212	85311	85301	6113.00	9N410	AH1ST
N0010485C2164	005384507	85221	85120	85087	74120.67	02989	AA2SS
N0010485C2176	0022030579	85252	85197	85124	43420.00	04454	AD2SS
N0010485C2186	010885247	85010	85220	85118	5674.50	01220	WJ4W3
N0010485C2195	010799801	85337	85272	85210	2654.89	9N610	ATESR
N0010485C2206	010292485	84293	85123	85105	26370.00	29078	CF0SV
N0010485C2209	004002895	84292	85138	85128	26920.82	32872	CXESZ
N0010485C2221	010291568	85006	85300	85300	507.20	29078	CF0SV
N0010485C2258	005495665	84554	85232	85084	229592.00	98089	BUTSL
N0010485C2261	010291850	84333	85208	85203	353587.10	9L305	CF1SV
N0010485C2272	003547881	84532	85327	85209	12403.50	3X594	KAASK
N0010485C2275	001867749	84556	85046	85349	35464.00	54027	BU4SL
N0010485C2286	003512692	85058	85304	85305	1525.92	6U479	CR0SX
N0010485C2305	010400311	85192	85097	85019	1639.14	6U479	CF0SV
N0010485C2319	010741910	84562	85259	85314	8519.10	22210	WR2WD
N0010485C2381	012074755	85099	85054	85040	59409.00	1A489	BF0SK
N0010485C2385	010300136	85052	85019	85305	20463.75	54267	CF0SV
N0010485C2438	000424437	85212	85207	85205	7301.70	21550	CR0SX
N0010485C2481	000616740	85207	85137	85008	7900.00	9L761	CR0SX
N0010485C2538	007661795	85256	85321	85120	8774.24	32872	CETSV
N0010485C2573	009286515	85203	85041	85203	1520.00	17955	CR0SX
N0010485C2578	LLHDQX361	85177	85357	85349	16569.40	6T584	
N0010485C2625	011228960	85053	85329	85274	1485.00	07800	CS0SX
N0010485C2627	010761710	85050	85319	85300	5700.00	16780	WR2WD
N0010485C2650	004946331	85044	85004	85272	4313.00	12180	CS0SX
N0010485C2641	011340558	84562	85202	85193	53768.00	6U481	CA0TG
N0010485C2655	011663878	85503	85290	85241	176613.00	97953	ESSTK
N0010485C2660	004409112	85067	85002	85321	5758.00	59475	

PIIN	NIIN	PURCH_DATE	RDO	CONT_COMP	EXT_DCL	FSCM	LRC
N0010485C2661	004594347	84356	65334	65306	33003.00	83002	DS4SY
N0010485C2681	000742039	54303	60150	60141	9693.00	31979	ERQSW
N0010485C2683	010700417	65003	65193	65349	23480.00	10786	CZLSZ
N0010485C2700	004041171	65017	65227	65223	49440.00	97108	DEZSW
N0010485C2711	007939575	65025	60105	65039	24912.00	28009	CS0SX
N0010485C2726	000757511	65039	60114	65052	39563.54	62748	CS0SX
N0010485C2731	010207097	65039	65214	65176	24103.00	55103	DPSSY
N0010485C2747	010570543	65080	65320	65173	301050.00	05404	DC7SW
N0010485C2775	003132504	65078	65043	65237	162477.90	15078	ETZSM
N0010485C2796	009284280	65116	65030	65303	5400.00	29489	CS0SX
N0010485C2797	008780723	65110	60110	65349	5001.00	12950	CS0SX
N0010485C2820	006757788	65173	60063	65050	4166.40	97105	CS0SX
N0010485C2820	003512681	65204	60197	65099	14352.00	29078	CS0SX
N0010485C2826	012019870	65112	65352	65233	1234055.20	56341	ETZSM
	012000605	65112	65352	65255	1234055.20	56341	ETZSM
	012030624	65112	65352	65255	1234055.20	56341	ETZSM
N0010485C2841	011566829	65230	60111	60003	709500.00	96467	ESSTK
N0010485C2346	010759978	65234	60259	60119	6327.05	54207	WRZWD
N0010485C2661	009801533	65214	60179	60140	3125.00	59475	DTDSY
N0010485C2900	011694550	64292	60095	65323	150590.00	07145	LUSTC
	011694560	64292	60095	65323	150590.00	07145	LUSTC
N0010485C2908	011459164	84292	85168	85151	119814.30	14028	LK4TH
N0010485C2922	010640265	84345	65249	65196	256094.00	50245	LL5TH
	010640266	84345	65249	65196	256094.00	50245	LL5TH
N0010485C2925	010457861	84334	85149	85128	23100.00	34355	LUCTC
N0010485C2931	011052846	84347	85305	85287	36300.00	51161	LUSTC
N0010485C2934	010103309	65004	60134	60120	601640.44	14028	LK4TH
N0010485C2936	011355987	84556	80204	65201	52250.00	96247	ECDSW
N0010485C2937	010640501	64550	85350	85287	606816.00	14028	LK4TH
N0010485C2960	010775935	65029	65203	65252	6048.00	15870	ECMSW
N0010485C2975	011657617	85234	65099	65079	48278.70	95260	LUSTC
N0010485C2983	011007575	65120	65060	65056	52134.00	55337	EGDSW
N0010485C2985	011953592	65063	60238	60019	9334.00	57701	LSATC
N0010485C2998	010285225	65059	65354	65261	252172.20	91196	EBLSP
N0010485C3005	011740292	65070	60005	65529	53400.00	91161	LUSTC
N0010485C3008	011222871	85078	60195	60002	27243.20	78732	LSATT
N0010485C3025	010181232	85098	85316	85287	43200.00	09440	EA4SP
N0010485C3032	008478005	85107	85317	85230	2190.00	30342	E81SP
N0010485C3040	011577033	65112	60232	65291	25750.00	14345	LUSTC
N0010485C3047	011575250	85130	60033	85349	630.54	57005	LUSTC
N0010485C3053	011510029	65130	60041	65349	47120.00	11550	LUSTC
N0010485C3059	010628557	65132	60312	60105	38241.00	14923	ERTSW
N0010485C3065	010400208	65103	60038	60027	56151.19	04034	EA4SP
N0010485C3066	010602272	85109	85109	85027	05364.97	33472	LH8TH
N0010485C3090	011078095	65218	60093	65040	80444.00	22978	LUSTC
N0010485C3098	000304055	85234	60079	85295	20990.30	22308	GBCSA
N0010485C3106	011547016	34280	65221	65216	42311.67	15700	PR4TQ
N0010485C3115	011638731	54290	65151	65063	5928.00	62005	WH2WS
N0010485C3124	011267239	64535	65212	65201	41550.00	14344	PNSTP
N0010485C3178	010706321	65007	60127	60071	75400.00	55595	EZ6TK
N0010485C3191	010648005	65025	65100	65306	100000.00	00497	WH2WS
N0010485C3201	011452801	65071	65281	65258	79101.74	00009	PT8TR

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N0010485C3238	010530957	85150	80061	85255	86230.00	56742	PY5T4
N0010485C3250	0101c6155	85080	85105	85115	1244750.70	85530	PY5TR
N0010485C3264	000761500	85205	87020	85175	4500.00	00c41	PYATR
N0010485C3275	001516741	85101	80170	80159	54800.00	00040	PR4T4
N0010485C3280	012139554	85110	80171	85102	1013013.75	85530	PY5TR
N0010485C3332	004859713	85231	86225	85111	49438.32	19150	P44T4
N0010485C3333	010842078	85220	85161	85075	795.00	0J997	WZ2WS
N0010485C3344	011359907	85294	85359	85215	2480.30	22305	PDATN
N0010485C3346	010957739	85241	85250	85199	6125.00	00947	WZ2WS
N0010485C3402	011411748	85200	85175	85210	13934.79	22305	PDATN
N0010485C3413	010505401	85281	85150	85139	183031.50	50009	PY5TR
N0010485C3419	011980048	85044	85194	85149	32902.18	80009	PY5TR
N0010485C3432	011690834	85225	85050	85027	54280.00	62997	PDATN
N0010485C3437	011720913	85231	85051	85114	15500.00	82005	PDATN
N0010485C3479	011005045	85564	85039	85064	55135.00	02849	PY4TK
N0010485C3489	011429024	85251	85190	85114	24442.00	90758	PM1TP
N0010485C3530	011281560	85003	85553	85280	58373.30	55404	WZ2WS
N0010485C3535	010790051	85052	85322	85263	9548.83	20710	RDZTU
N0010485C3567	011099542	85070	85187	85151	46025.00	94053	EGWS4
N0010485C3572	008795505	85081	85077	85062	98415.00	20199	EXRSN
N0010485C3577	010292158	85058	85153	85065	11350.11	55641	REYTU
N0010485C3583	004704748	85102	85007	85203	23080.00	55236	RR0TW
N0010485C3612	011198505	85148	85143	85291	29760.00	2N220	RM0TV
N0010485C3622	010790052	85178	85247	85124	4694.50	20710	RDZTU
N0010485C3632	010283552	85169	85227	85215	11655.00	60554	REYTU
N0010485C3646	008792154	85224	85203	85075	154970.00	26199	EXRSN
N0010485C3647	007591289	85211	85206	85199	40800.00	CU929	ELLSQ
N0010485C3649	004829250	85007	85227	85121	42935.83	55464	F5197
	004629251	85007	85227	85121	42935.83	05404	FSA97
N0010485C3650	011138731	85264	85175	85151	78202.00	07542	EZ6TK
N0010485C3653	010782559	85224	85181	85108	15020.50	55767	RDZTU
N0010485C3675	011152113	85240	85145	85040	80230.00	02101	RDZTU
N0010485C3700	009803700	85273	85180	85168	74003.90	05404	FCA97
N0010485C3900	011874962	85050	85170	85139	32320.00	62874	BSOSU
N0010485C3914	001044862	85063	85363	85360	08520.00	02131	DDSSW
N0010485C3915	LLCF20146	85004	85124	85122	29941.12	YR715	
N0010485C3940	011637561	85162	85343	85298	54917.00	58641	LUBTC
N0010485C3950	009607769	85059	85059	85253	5383.30	40541	RAZTU
	009607819	85059	85059	85235	5383.30	40541	RAZTU
N0010485C3968	005354872	85093	85008	85282	75156.18	26300	FK997
N0010485C3970	006298895	85123	85062	85358	1410.00	36271	CS0SX
N0010485C3979	009667381	85267	85062	85062	53009.04	29732	DP5SY
N0010485C4006	010292594	85502	85217	85155	2565.00	59475	AK1SU
N0010485C4010	011477519	85206	85206	85195	95522.00	20019	EBLSP
N0010485C4012	LLME35584	85226	85013	85354	54555.90	34345	KAA34
N0010485C4013	009284032	85213	85150	85094	1406.25	02004	RDZTU
N0010485C4021	LLCF35790	85523	85048	85025	90000.00	55380	
N0010485C4023	006616033	85565	85150	85143	27892.00	52202	PN5TP
N0010485C4226	000517599	85007	85065	85181	51500.00	54260	HSASJ
N0010485C4237	000799625	84257	85354	84239	122040.00	14304	PPGTS
	000799627	84257	85354	84284	122040.00	14304	PPGTS
N0010485C4439	011507355	85009	85304	85252	144556.00	0L603	JXEF5

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N0010485C4448	011665674	20029	55205	86170	91517.00	34494	JXV73
N0010485C4464	002731889	55052	55274	86176	43200.00	1E012	JXU73
N0010485C4515	005071377	55127	00135	66062	12012.00	2P454	JXF73
N0010485C4534	010755050	55209	55144	86155	16170.00	1V659	JXG73
N0010485C4539	011157645	55151	55056	86064	53562.00	6M851	JXJ73
N0010485C4540	002215247	55146	00130	86120	47160.00	17061	JXF73
N0010485C4543	004022400	55152	55046	86135	19247.70	11259	JXG73
N0010485C4549	010617011	55170	55237	86210	41530.00	02750	JXE73
N0010485C4561	012004485	55145	55350	55294	45866.44	34217	JXF73
N0010485C4563	004409112	55270	55235	86135	5247.00	54729	
N0010485C4583	000505147	55259	86074	86057	13771.35	9N616	CP8SX
N0010485C4602	011752057	55199	55104	86084	80552.55	55362	KAASH
N0010485C4610	011202509	55006	55220	55205	49999.38	00464	DC15W
N0010485C4635	010655605	55220	55181	86162	2600.00	21930	JXV73
N0010485C4647	003026371	55235	55111	86275	7320.00	22237	JXE73
N0010485C4656	010856707	55253	55090	86083	47073.00	17794	JXE73
N0010485C4664	010199337	55241	55241	86027	45948.00	26562	JXF73
N0010485C4707	010292359	85270	55165	86120	1500.00	27594	CF6SV
N0010485C4717	002252248	55211	55080	86077	19890.00	9N610	B04SL
N0010485C4720	008131098	55211	86180	86062	23006.50	55358	B04SL
NJU10485C4740	001754833	86039	55220	86196	27460.18	20029	B03SL
N0010485C4765	011231927	85301	55226	86195	1465.00	75305	CRSSX
N0010485C4953	010317220	85359	55184	86151	4902.90	16096	CF15V
N0010485C4970	005434205	65259	86159	86124	02250.72	63042	B03SL
N0010485C4973	010291440	65365	00268	86215	458.79	06019	CZ4SZ
N0010485C4992	011062961	65270	86175	86168	77500.00	19591	CETSV
N0010485C4994	007457658	85271	55258	86215	6850.00	51046	CR8SX
N0010485C5096	011015064	85259	55190	86089	24990.00	55059	ETZSM
N0010485C5123	010474943	55273	87053	86215	30413.00	59475	DC15W
N0010485C5304	010391484	65240	55121	86099	30520.74	14020	LK4TH
N0010485C5305	010775937	85253	60138	55107	20534.00	15870	ECMSL
N0010485C5314	002523395	85257	55202	00127	75300.00	20948	EMMSP
N0010485C5315	008053216	65264	86204	86202	23452.00	20254	EGLSL
N0010485C5419	010292509	65262	87042	86215	5962.00	59475	AK1SU
N0010485C5432	010292591	65269	86294	86202	5382.00	59475	AK1SU
N0010485C5439	004588294	65280	55295	86178	44808.00	61574	EXDSM
N0010485C5450	002081202	55273	57173	86212	1745.00	59475	AT0SR
N0010485C5707	001139895	65261	55100	86151	47038.00	53154	GF350
N0010485C5774	010291457	86027	86027	86196	2257.20	62212	CZ4SZ
N0010485C5780	010293191	85273	66170	86077	35372.80	60765	CU2SX
NJU10485C5858	000321517	65273	50158	86113	33471.52	15809	HFASG
N0010485C5860	010497174	65273	50135	86062	66900.00	52081	HFASH
N0010486C8004	011703481	86016	55150	86087	1138.00	53959	CY4SL
N0010486C8010	009379364	86010	66322	55126	1305.83	3T362	CY4SL
	009379388	86010	55322	86126	1505.83	3T362	CY4SL
N0010486C8024	000250734	86103	55305	86210	48.00	5M254	CY4SL
N0010486CC012	005738075	55017	55240	55151	71575.00	60047	HFASH
N0010486CXU04	010323565	65345	55190	55105	23290.00	4V724	
	011320068	65345	55193	55105	23290.00	4V724	JXZ73
	011320072	65343	55198	55105	23290.00	4V724	JXZ73
	011320074	65343	55190	55105	23290.00	4V724	JXZ73
	011320076	65343	55190	55105	23290.00	4V724	JXZ73

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N0010486CXU04	011342905	05543	56193	56105	23290.00	4V724	JXZ75
N0010486C0001	006907552	05501	56140	56099	21075.75	16972	GNFSG
N0010486C0015	002043093	05501	56140	56113	55616.00	3N183	GGESD
N0010486C0019	010108517	06010	56170	56139	28820.00	07332	GPGSU
N0010486C0037	010006134	05504	56240	56209	53632.10	75333	GPESU
N0010486C0063	008773157	06037	56217	56181	106265.95	06071	GNFSD
N0010486C0069	011212545	05529	56120	56113	20448.00	99517	GLESD
N0010486C0074	012244578	05531	56320	56196	14706.00	17052	GLFSO
N0010486C0075	008777552	06010	56146	56177	52475.00	30359	GBCS4
N0010486C0109	011773298	06015	56193	56103	35262.25	13859	GNFSD
N0010486C0111	011903094	06015	56325	56210	47575.00	24047	GAESA
N0010486C0144	011489913	06051	56231	56183	73440.00	80554	GCASU
N0010486C0205	011641492	06084	56324	56210	55600.00	11839	GLFSB
N0010486C0297	011175807	86155	57001	56216	51200.00	12489	GECSA
N0010486C0925	010603507	85504	56304	56124	104315.00	03657	MEGSM
N0010486CJY36	010992871	85526	56120	56120	65504.00	90911	HSASJ
N0010486C0940	0108811505	85526	56141	56097	44401.00	90911	HSCSJ
N0010486C0947	0109311198	85557	56305	56168	1293462.00	61122	HEDSG
N0010486C0977	011406765	86085	56205	56202	51142.75	15309	HSBSJ
N0010486CJY06	009259023	86029	56239	56215	27679.20	54549	HEPSG
N0010486C0991	LLHDPF513	86030	56202	56182	155000.00	22501	HFASH
N0010486C1411	010954805	86014	56104	56136	15249.00	4YU69	HCVS6
N0010486C1425	010511912	85512	80227	66202	105050.00	55074	HVKSO
N0010486C1514	008485324	86029	56209	56196	24065.70	53159	HYASO
N0010486C1516	010989465	86253	56253	56216	11900.00	17062	HCVS6
N0010486C1533	001053161	86044	86234	56210	10000.00	17062	GFCSO
N0010486C1552	012105988	86056	80230	56216	6530.00	86546	HCVS6
N0010486C1561	011235815	86058	56148	56112	7200.00	52250	HYESO
N0010486C2105	000274839	86008	56318	56108	2722.50	27594	BDDSK
N0010486C2138	010686186	85524	56239	56151	39296.00	96341	AJ1ST
N0010486C2141	002101956	85511	56210	56168	17145.16	32372	
N0010486C2500	007690959	86009	56099	86050	151264.00	9N865	CF1SV
N0010486C2503	011547053	86024	86249	86211	80560.00	20019	BUBSL
N0010486C2541	150560307	85508	56193	86097	3534.00	07310	BFOSK
N0010486C2574	010905983	86007	86247	86098	2388.00	53260	CROSSX
N0010486C2577	011773201	85538	56234	86215	28550.00	00742	BUBSL
N0010486C2589	010578455	85539	56184	56181	14567.80	86763	CRSSX
N0010486C2698	011594341	86059	56219	86210	35760.20	23902	
N0010486C3403	005300652	85284	56129	56105	22950.00	4K539	CHASV
N0010486C5443	010708280	85326	56200	56164	79500.00	05627	EZOTK
N0010486C5462	006772540	85331	56210	56192	40307.40	45990	CSOSX
N0010486C3508	008768715	86002	56242	66202	5250.00	29489	CSOSX
N0010486C3906	010178409	86008	56188	56181	59720.00	05947	EAUSP
N0010486C3915	001341457	86029	56259	66210	5550.00	27905	LKBTH
N0010486C5930	011584922	86028	56208	56202	91465.00	14844	LL3TH
N0010486C4512	010171059	85291	57012	86035	41584.00	40541	WU3W3
N0010486C4529	010630704	86015	56155	86099	55038.56	34280	PY4TK
N0010486C4541	010937808	85350	56202	56133	26040.00	5475	PNTSP
N0010486C4553	010937587	86002	56212	56182	7760.00	82005	WM2W3
N0010486C4587	010742021	86023	56233	56215	25240.00	14139	PDATN
N0010486C4424	004900097	86108	57013	86196	1552.50	50097	PM1TP
N0010486C4920	004332839	85333	56143	56139	15285.00	91750	REOTU

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N001048604943	LL2010349	86044	56244	56216	22470.00	1A489	WM1W4
N001048604953	LLX950237	86034	56214	56120	50414.10	13859	FW8Y1
N001048604960	011837802	86043	56323	56217	4138.54	75793	RFSTU
N001048605049	009083615	86149	56324	56202	14262.52	06515	FEAY1
N001048605107	009549485	86294	56164	56055	112096.00	04505	JX=75
N001048605719	011761409	85505	56230	56170	1580.95	3X694	JXD75
N0022185CXU55	011315422	84345	56240	55245	5527.50	55159	JXP75
N0022185CX159	010106407	85176	56155	56120	4876.00	07107	JXP75
N0022185CX144	010291122	85134	56150	56124	2874.00	72423	JXP75
N0040665C0335	012145132	85252	56342	55334	600000.00	20386	LEZTY
N0061285CT160	000221147	84258	56300	55300	14976.00	34779	JXS75
N0061285CT161	001280942	84305	56300	56100	53048.00	20644	JXS75
	001572105	84303	56250	56105	53095.00	20644	JXS75

APPENDIX C FAR CLAUSES - CONTRACT DELIVERY:
PART 12 and 52

PART 12

CONTRACT DELIVERY OR
PERFORMANCE

12.000 Scope of part.

This part prescribes policies and procedures relating to delivery or performance under contracts for supplies, services, and construction.

SUBPART 12.1—DELIVERY OR PERFORMANCE
SCHEDULES

12.101 General.

(a) The time of delivery or performance is an essential contract element and shall be clearly stated in solicitations. Contracting officers shall ensure that delivery or performance schedules are realistic and meet the requirements of the acquisition. Schedules that are unreasonably tight or difficult of attainment (1) tend to restrict competition, (2) are inconsistent with small business policies, and (3) may result in higher contract prices.

(b) Solicitations shall, except when clearly unnecessary, inform bidders or offerors of the basis on which their bids or proposals will be evaluated with respect to time of delivery or performance.

(c) If timely delivery or performance is unusually important to the Government, liquidated damages clauses may be used (see Subpart 12.2).

12.102 Factors to consider in establishing schedules.

(a) *Supplies or services.* When establishing a contract delivery or performance schedule, consideration shall be given to applicable factors such as the—

- (1) Urgency of need;
- (2) Production time;
- (3) Market conditions;
- (4) Transportation time;
- (5) Industry practices;
- (6) Capabilities of small business concerns;
- (7) Administrative time for obtaining and evaluating offers and for awarding contracts;
- (8) Time for contractors to comply with any conditions precedent to contract performance; and

(9) Time for the Government to perform its obligations under the contract; e.g., furnishing Government property.

(b) *Construction.* When scheduling the time for completion of a construction contract, the contracting officer shall consider applicable factors such as the—

- (1) Nature and complexity of the project;

- (2) Construction seasons involved;
- (3) Required completion date;
- (4) Availability of materials and equipment;
- (5) Capacity of the contractor to perform; and
- (6) Use of multiple completion dates. (In any given contract, separate completion dates may be established for separable items of work. When multiple completion dates are used, requests for extension of time must be evaluated with respect to each item, and the affected completion dates modified when appropriate.)

12.103 Supplies or services.

(a) The contracting officer may express contract delivery or performance schedules in terms of—

- (1) Specific calendar dates;
- (2) Specific periods from the date of the contract; i.e., from the date of award or acceptance by the Government, or from the date shown as the effective date of the contract;
- (3) Specific periods from the date of receipt by the contractor of the notice of award or acceptance by the Government (including notice by receipt of contract document executed by the Government); or
- (4) Specific time for delivery after receipt by the contractor of each individual order issued under the contract, as in indefinite delivery type contracts and GSA schedules.

(b) The time specified for contract performance should not be curtailed to the prejudice of the contractor because of delay by the Government in giving notice of award.

(c) If the delivery schedule is based on the date of the contract, the contracting officer shall mail or otherwise furnish to the contractor the contract, notice of award, acceptance of proposal, or other contract document not later than the date of the contract.

(d) If the delivery schedule is based on the date the contractor receives the notice of award, or if the delivery schedule is expressed in terms of specific calendar dates on the assumption that the notice of award will be received by a specified date, the contracting officer shall send the contract, notice of award, acceptance of proposal, or other contract document by certified mail, return receipt requested, or by any other method that will provide evidence of the date of receipt.

(e) In invitations for bids, if the delivery schedule is based on the date of the contract, and a bid offers delivery based on the date the contractor receives the contract or notice of award, the contracting officer

shall evaluate the bid by adding 5 days (as representing the normal time for arrival through ordinary mail). If the offered delivery date computed with mailing time is later than the delivery date required by the invitation for bids, the bid shall be considered nonresponsive and rejected. If award is made, the delivery date will be the number of days offered in the bid after the contractor actually receives the notice of award.

12.104 Contract clauses.

(a) *Supplies or services.* (1) The contracting officer may use a time of delivery clause to set forth a required delivery schedule and to allow an offeror to propose an alternative delivery schedule. The clauses and their alternates may be used in solicitations and contracts substantially as shown, they may be changed, or new clauses may be written.

(2) The contracting officer may insert in solicitations and contracts for supplies or services a clause substantially the same as the clause at 52.212-1, Time of Delivery, if the Government requires delivery by a particular time and the delivery schedule is to be based on the date of the contract. If the delivery schedule is expressed in terms of specific calendar dates or specific periods and is based on an assumed date of award, the contracting officer may use the clause with its Alternate I. If the delivery schedule is expressed in terms of specific calendar dates or specific periods and is based on an assumed date the contractor will receive notice of award, the contracting officer may use the clause with its Alternate II. If the delivery schedule is to be based on the actual date the contractor receives a written notice of award, the contracting officer may use the clause with its Alternate III.

(3) The contracting officer may insert in solicitations and contracts for supplies or services a clause substantially the same as the clause at 52.212-2, Desired and Required Time of Delivery, if the Government desires delivery by a certain time but requires delivery by a specified later time, and the delivery schedule is to be based on the date of the contract. If the delivery schedule is expressed in terms of specific calendar dates or specific periods and is based on an assumed date of award, the contracting officer may use the clause with its Alternate I. If the delivery schedule is expressed in terms of specific calendar dates or specific periods and is based on an assumed date the contractor will receive notice of award, the contracting officer may use the clause with its Alternate II. If the delivery schedule is to be based on the actual date the contractor receives a written notice of award, the contracting officer may use the clause with its Alternate III.

(b) *Construction.* The contracting officer shall insert the clause at 52.212-3, Commencement, Prosecution, and Completion of Work, in solicitations and contracts when a fixed-price construction contract is contemplat-

ed. The clause may be changed to accommodate the issuance of orders under indefinite-delivery contracts. If the completion date is expressed as a specific calendar date, computed on the basis of the contractor receiving the notice to proceed by a certain day, the contracting officer may use the clause with its Alternate I.

52.212-1 Time of Delivery.

As prescribed in 12.104(a)(2), the contracting officer may insert a clause substantially as follows in solicitations and contracts for supplies or services if the Government requires delivery by a particular time and the delivery schedule is to be based on the date of the contract:

TIME OF DELIVERY (APR 1984)

(a) The Government requires delivery to be made according to the following schedule:

REQUIRED DELIVERY SCHEDULE

[Contracting Officer insert specific details]

ITEM NO	QUANTITY	WITHIN DAYS AFTER DATE OF CONTRACT
-----	-----	-----
-----	-----	-----
-----	-----	-----

The Government will evaluate equally, as regards time of delivery, offers that propose delivery of each quantity within the applicable delivery period specified above. Offers that propose delivery that will not clearly fall within the applicable required delivery period specified above, will be considered nonresponsive and rejected. The Government reserves the right to award under either the required delivery schedule or the proposed delivery schedule, when an offeror offers an earlier delivery schedule than required above. If the offeror proposes no other delivery schedule, the required delivery schedule above will apply.

OFFEROR'S PROPOSED DELIVERY SCHEDULE

ITEM NO.	QUANTITY	WITHIN DAYS AFTER DATE OF CONTRACT

(b) Attention is directed to the Contract Award provision of the solicitation that provides that a written award or acceptance of offer mailed, or otherwise furnished to the successful offeror, results in a binding contract. The Government will mail or otherwise furnish to the offeror an award or notice of award not later than the day award is dated. Therefore, the offeror should compute the time available for performance beginning with the actual date of award, rather than the date the written notice of award is received from the Contracting Officer through the ordinary mails. However, the Government will evaluate an offer that proposes delivery based on the Contractor's date of receipt of the contract or notice of award by adding five days for delivery of the award through the ordinary mails. If, as so computed, the offered delivery date is later than the required delivery date, the offer will be considered nonresponsive and rejected.

(End of clause)

(R 7-104.92(b) 1974 APR)

(R 1-1.316-5)

(R 1-1.316-4(c))

Alternate I (APR 1984). If the delivery schedule is expressed in terms of specific calendar dates or specific periods and is based on an assumed date of award, the contracting officer may substitute the following paragraph (b) for paragraph (b) of the basic clause. The time may be expressed by substituting "on or before"; "during the months ..."; or "not sooner than ... or later than ..." as headings for the third column of paragraph (a) the basic clause.

(b) The delivery dates or specific periods above are based on the assumption that the Government will make award by[Contracting Officer insert date]. Each delivery date in the delivery schedule above will be extended by the number of calendar days after the above date that the contract is in fact awarded. Attention is directed to the Contract Award provision of the solicitation that provides that a written award or acceptance of offer mailed or otherwise furnished to the successful offeror results in a binding contract. Therefore, the offeror should compute the time available for performance beginning with the actual date of award, rather than the date the written notice of award is received from the Contracting Officer through the ordinary mails.

(R 7-104.92(e) 1974 APR)

(R 1-1.316-4(b)(1))

Alternate II (APR 1984). If the delivery schedule is expressed in terms of specific calendar dates or specific periods and is based on an assumed date the contractor will receive notice of award, the contracting officer may substitute the following paragraph (b) for paragraph (b) of the basic clause. The time may be expressed by substituting "within days after the date of receipt of a written notice of award" as the heading for the third column of paragraph (a) of the basic clause.

(b) The delivery dates or specific periods above are based on the assumption that the successful offeror will receive notice of award by[Contracting Officer insert date]. Each delivery date in the delivery schedule above will be extended by the number of calendar days after the above date that the Contractor receives notice of award; provided, that the Contractor promptly acknowledges receipt of notice of award.

(R 7-104.92(e)(2) 1974 APR)

(R 1-1.316-4(b)(2))

Alternate III (APR 1984). If the delivery schedule is to be based on the actual date the contractor receives a written notice of award, the contracting officer may delete paragraph (b) of the basic clause. The time may be expressed by substituting "within days after the date of receipt of a written notice of award" as the heading for the third column of paragraph (a) of the basic clause.

52.212-2 Desired and Required Time of Delivery.

As prescribed in 12.104(a)(3), the contracting officer may insert a clause substantially as follows in solicitations and contracts for supplies or services if the Government desires delivery by a certain time, but requires delivery by a specified later time, and the delivery schedule is to be based on the date of the contract:

DESIRABLE AND REQUIRED TIME OF
DELIVERY (APR 1984)

(a) The Government desires delivery to be made according to the following schedule:

DESIRABLE DELIVERY SCHEDULE

[Contracting Officer insert specific details]

ITEM NO.	QUANTITY	WITHIN DAYS AFTER DATE OF CONTRACT

If the offeror is unable to meet the desired delivery schedule, it may, without prejudicing evaluation of its offer, propose a delivery schedule below. However, the offeror's proposed delivery schedule must not extend the delivery period beyond the time for delivery in the Government's required delivery schedule as follows:

REQUIRED DELIVERY SCHEDULE

[Contracting Officer insert specific details]

ITEM NO.	QUANTITY	WITHIN DAYS AFTER DATE OF CONTRACT

Offers that propose delivery of a quantity under such terms or conditions that delivery will not clearly fall within the applicable required delivery period specified above, will be considered nonresponsive and rejected. If the offeror proposes no other delivery schedule, the desired delivery schedule above will apply.

OFFEROR'S PROPOSED DELIVERY SCHEDULE

ITEM NO.	QUANTITY	WITHIN DAYS AFTER DATE OF CONTRACT

(b) Attention is directed to the Contract Award provision of the solicitation that provides that a written award or acceptance of offer mailed or otherwise furnished to the successful offeror results in a binding contract. The Government will mail or otherwise furnish to the offeror an award or notice of award not later than the day the award is dated. Therefore, the offeror shall compute the time available for performance beginning with the actual date of award, rather than the date the written notice of award is received from the Contracting Officer through the ordinary mails. However, the Government will evaluate an offer that proposes delivery based on the Contractor's date of receipt of the contract or notice of award by adding five days for delivery of the award through the ordinary mails. If, as so computed, the offered delivery date is later than the required delivery date, the offer will be considered nonresponsive and rejected.

(End of clause)

(R 7-104.92(c) 1974 APR)

(R 1-1.316-5(c))

(R 1-1.316-4(c))

Alternate I (APR 1984). If the delivery schedule is expressed in terms of specific calendar dates or specific periods and is based on an assumed date of award, the contracting officer may substitute the following paragraph (b) for paragraph (b) of the basic clause. The time may be expressed by substituting "on or before"; "during the months . . ."; or "not sooner than . . . or later than . . ." as headings for the third column of paragraph (a) of the basic clause.

(b) The delivery dates or specific periods above are based on the assumption that the Government will make award by [Contracting Officer insert date]. Each delivery date in the delivery schedule above will be extended by the number of calendar days after the above date that the contract is in fact awarded. Attention is directed to the Contract Award provision of the solicitation that provides that a written award or acceptance of offer mailed or otherwise furnished to the successful offeror results in a binding contract. Therefore, the offeror shall compute the time available for performance beginning with the actual date of award, rather than the date the written notice of award is received from the Contracting Officer through the ordinary mails.

(R 7-104.92(e) 1974 APR)

(R 1-1.316-4(b)(1))

Alternate II (APR 1984). If the delivery schedule is expressed in terms of specific calendar dates or specific periods and is based on an assumed date the contractor receives notice of award, the contracting officer may substitute the following paragraph (b) for paragraph (b) of the basic clause. The time may be expressed by substituting "within days after the date of receipt of a written notice of award" as the heading of the third column of paragraph (a) of the basic clause.

(b) The delivery dates or specific periods above are based on the assumption that the successful offeror will receive notice of award by [Contracting Officer insert date]. Each delivery date in the delivery schedule above will be extended by the number of calendar days after the above date that the Contractor receives notice of award; provided, that the Contractor promptly acknowledges receipt of notice of award.

(R 7-104.92(e)(2) 1974 APR)

(R 1-1.316-4(b)(2))

Alternate III (APR 1984). If the delivery schedule is to be based on the actual date the contractor receives a written notice of award, the contracting officer may delete paragraph (b) of the basic clause. The time may be expressed by substituting "within days after the date of receipt of a written notice of award" as the heading of the third column of paragraph (a) of the basic clause.

APPENDIX D: RESEARCHER PROPOSED CHANGES TO FAR

FAR PART 12: Delivery or Performance

12.104

- (4) The contracting officer may insert in solicitations and contracts for supplies and services a clause substantially the same as the clause at 52.212-xx, Desired Time of Delivery, if the government desires delivery of routine supplies by a certain date but does not have a required delivery date, and the date is based on the date of the contract.

52.212 is amended by adding the following:

52.212-xx. Desired Time of Delivery:

- (a) The Government desires delivery to be made according to the following schedule:

DESIRED DELIVERY SCHEDULE

<u>ITEM NO.</u>	<u>QUANTITY</u>	<u>WITHIN DAYS AFTER DATE OF CONTRACT</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____

If the offeror is unable to meet the desired schedule, he may, without prejudicing evaluation of its offer, propose a delivery schedule below:

If the offeror proposes no other delivery schedule, the desired delivery schedule above will apply.

DELIVERY & ACCEPTED DELIVERIES

<u>ITEM</u>	<u>QUANTITY</u>	<u>DATE OF RECEIPT</u>

(B) Supplies/Services tendered for acceptance 60 calander days prior to the desired delivery date will be processed as delivered on time.

APPENDIX E
INTERVIEWEES

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